West Valley Demonstration Project

Solid Waste Management Unit Assessment and Description of Current Conditions Report

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Prepared For: U.S. Department of Energy, Ohio Field Office (OH/WVDP)

November 29, 2004

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1.0 INTRODUCTION

The Western New York Nuclear Service Center (WNYNSC) is located near West Valley, New York and is the location of the only commercial nuclear fuel reprocessing facility to have operated in the United States. The New York State Energy Research and Development Authority (NYSERDA) holds title to the WNYNSC for the state of New York. Nuclear Fuel Services, Inc. (NFS), the commercial operator, operated the fuel reprocessing facility at the WNYNSC under Nuclear Regulatory Commission (NRC) Operating License CSF-1 from 1966 to 1972 on land leased by NFS from New York State. During this time, NFS reprocessed about 1.4 million pounds (640 metric tons) of spent reactor fuel. The reprocessing operation generated approximately 600,000 gallons (gal) (2.3 million liters [L]) of high-level radioactive waste that was transferred into underground tanks for storage. In 1972, NFS closed the Process Building for modifications to expand its capabilities, but subsequently decided not to resume operations. The terms of the contract between the state and NFS required the state to assume responsibility for the facilities and wastes when NFS terminated the lease.

In 1980, Congress passed the West Valley Demonstration Project (WVDP) Act (U.S. Congress October 1, 1980), Public Law 96-368. The WVDP Act directed the U.S. Department of Energy (DOE) to solidify the high-level waste (HLW) in a form suitable for transportation and disposal, develop containers suitable for permanent disposal, dispose of low-level and transuranic (TRU) waste from the WVDP in accordance with applicable licensing requirements, and decontaminate and decommission tanks (D&D), facilities, and any material and hardware used in connection with the WVDP in accordance with NRC requirements. In September 1981 the NRC amended the operating license to transfer exclusive use and possession of the facilities to DOE for conduct of the WVDP. (NYSERDA continues to be licensed as the owner; however, the requirements of the license are being held in abeyance during the term of DOE's exclusive use and possession of the WVDP premises.) On February 25, 1982, DOE assumed operational control of the WVDP portion of the WNYNSC to conduct the requirements of the WVDP Act. In May 1990, New York State was authorized by the U.S. Environmental Protection Agency (EPA) to implement the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Program; specifically hazardous and hazardous radioactive (i.e., mixed) wastes. Subsequently, DOE submitted a RCRA Part A Permit application to the New York State Department of Environmental Conservation (NYSDEC) to operate the WVDP under interim status.

An Administrative Order on Consent (hereafter referred to as Consent Order) under Section 3008(h) of the Hazardous and Solid Waste Amendments of RCRA was issued on consent to the DOE and the NYSERDA by the EPA and the NYSDEC. The DOE and NYSERDA are collectively referred to as “Respondent” or “Respondents” in the March 1992 Consent Order. In accordance with the RCRA §3008(h) Consent Order, the following were performed by the DOE on the WVDP premises:

- Interim Measures to reduce or eliminate threats to human health or the environment;

- A RCRA Facility Investigation (RFI) to fully determine the nature and extent of any release(s) of hazardous waste and/or hazardous constituents from WVDP Solid Waste Management Units (SWMUs) into the environment;

- Notification to the EPA and NYSDEC, in writing, within 15 days of discovery of any new SWMU where required by EPA and NYSDEC;

- Preparation of a SWMU assessment plan within 60 days from notification of a new SWMU, including a proposed schedule of implementation and completion of the assessment for each new SWMU identified subsequent to issuance of the RCRA §3008(h) Consent Order; and

- Submittal of quarterly progress reports within 45 days following the end of a quarter to the EPA and NYSDEC until termination of the RCRA §3008(h) Consent Order.

In the RCRA §3008(h) Consent Order, DOE is identified as the operator of the WVDP and NYSERDA is identified as the owner of the WNYNSC, except those parts that are used or are in the possession of DOE as part of the WVDP. As also specified in the RCRA §3008(h) Consent Order, DOE and NYSERDA reserve the right to seek judicial review of disputes between them concerning their respective authority and responsibility arising from or related to the WVDP Act or the Cooperative Agreement between DOE and NYSERDA. In addition to DOE activities performed as summarized above, NYSERDA has sole responsibilities under the RCRA §3008(h) Consent Order for several SWMUs including the New York State-Licensed Disposal Area (SDA). These SWMUs are not included in this report because these SWMUs are the sole responsibility of NYSERDA, are evaluated in a separate RFI performed by NYSERDA, and are not part of the WVDP premises. NYSERDA addresses their SWMUs and operates under a separate EPA I.D. number and a separate RCRA Part A Permit application and the RCRA §3008(h) Consent Order clearly identifies roles and responsibilities with this respect.

In accordance with the terms of the Consent Order, 47 SWMUs have been identified for the WVDP and notification was made to the EPA and NYSDEC regarding each unit's history and status. Additionally, several cells in the Process Building, referred to as "Sealed Rooms" are included in Super Solid Waste Management Unit (SSWMU) #3. The individual SWMUs, including the Sealed Rooms (as indicated by the "Process Plant" designation), are presented on Figure 1-1. A *West Valley Demonstration Project RCRA Facility Investigation (RFI) Work Plan* (WVDP-RFI-014) (West Valley Nuclear Services Co., LLC [WVNSCO], December 1993) was developed for the WVDP and approved by the EPA and NYSDEC (September 30, 1993, Appendix A), and implemented for the originally-identified SWMUs. Because some SWMUs were contiguous or so close as to make monitoring separate units impractical, individual SWMUs were grouped into 11 WVDP SSWMUs for the purpose of completing the RFI. For SWMUs identified later and therefore not addressed in the RFI Work Plan, RCRA Facility Assessments (RFAs), Preliminary Reviews (PRs), and, if required, RFIs have been subsequently performed. The RFI, the RFAs, and the PR Reports were previously transmitted to the EPA and NYSDEC and subsequently approved by the Agencies, as discussed and referenced in Sections 4.0 and 5.0. The only exceptions to this are for SWMU #45 - Breach in Laundry Wastewater Line, SWMU #46 - Concrete Vault Staging Area, and SWMU #47 - Remote-Handled Waste Facility for which notifications were made during the past year.

In response to a request from the NYSDEC dated January 7, 2004 and subsequent discussions, this current conditions report has been prepared to provide supporting information for regulatory decision making regarding WVDP SWMUs, which have been previously identified and investigated in accordance with the terms of the Consent Order. The operational activities summarized in Sections 4.0 and 5.0 for individual SWMUs provide site information updated as of September 30, 2004, and the post-RFI analytical data reported is updated based on validated laboratory data for June 2004, unless otherwise noted.

2.0 FACILITY BACKGROUND

Extensive environmental information has been compiled that details the specifics of the topography, geology, groundwater and surface water hydrology, geochemistry, and water quality in the vicinity of the WNYNSC. (See *Volume 1, Introduction and General Site Overview* [WVDP-RFI-017] [WVNSCO, May 1994]). The following sections provide a brief summary of environmental conditions at the WVDP.

2.1 Site Description

The WVDP is located in northern Cattaraugus County, about 30 miles (mi) (50 kilometers [km]) south of Buffalo, New York (Figure 1-1). The WVDP facilities occupy a security-fenced area of about 166 acres (67 hectares [ha]) within the WNYNSC. This fenced area is referred to as the Project premises.

The WVDP is situated on New York State's Allegheny Plateau at an approximate average elevation of 1,300 feet (400 m). The communities of West Valley, Riceville, Ashford Hollow, and the village of Springville are located within approximately 5 mi (8 km) of the Project. Several roads and a railway approach or pass through the WNYNSC, but the public does not have access to the WNYNSC. Hunting, fishing, and human habitation on the WNYNSC generally are prohibited. A NYSERDA-sponsored program to control the deer population, initiated in 1994, continues through the present. Limited access to the WNYNSC was given to local hunters, and community response has been favorable.

2.2 Environmental Background

2.2.1 Climate and Meteorology

Although there are recorded extremes of 98.6°F (37°C) and -43.6°F (-42°C) in western New York, the climate is moderate, with an average annual temperature (1971–2000) of 48°F (8.9°C). Rainfall is relatively high, averaging about 41 inches (104 centimeters [cm]) per year. Precipitation in 2003 totaled 41 inches (104 cm), equal to the long-term average. Precipitation is evenly distributed throughout the year and is markedly influenced by Lake Erie to the west and, to a lesser extent, by Lake Ontario to the north. Regional winds are generally from the west and south at about 9 mph (4 m/sec).

2.2.2 Topography, Surface Drainage, Surrounding Land Use

The WVDP is relatively level with changes in topography generally associated with Frank's Creek and Erdman Brook. The elevation of the WVDP ranges from the west to east from approximately 1,450 ft (442 m) along Rock Springs Road to approximately 1,305 ft (398 m) near the confluence of Frank's Creek and Erdman Brook. From the south to north, the elevation of the WVDP ranges from approximately 1,390 ft (424 m) by the Radwaste Treatment System (RTS) Drum Cell to approximately 1,370 ft (418 m) north of the Construction and Demolition Debris Landfill (CDDL).

Surface water at the WVDP is controlled by a series of storm water ditches that convey surface water into Erdman Brook, Frank's Creek, Quarry Creek, or unnamed tributaries of Buttermilk Creek. Erdman Brook and Frank's Creek are generally northward flowing tributaries combining with Quarry Creek to flow into Buttermilk Creek.

The land within 5 mi (8 km) of the WNYNSC is primarily used for agriculture and arboriculture. The major exception to this is the Village of Springville, which is residential and commercial. Other nonagricultural land uses in the vicinity of the WNYNSC include: 1) hamlet of West Valley (residential) and 2) Cattaraugus County forest. The dominant agricultural activity is related to the dairy industry, with meat production occurring on a smaller scale. Agricultural lands cultivated to produce fruit and vegetables are not as prominent as cropland or pastureland.

2.2.3 Hydrostratigraphy

The WVDP is located on the dissected and glaciated Allegheny Plateau and is underlain by a thick sequence of Holocene and Pleistocene sediments deposited in a steep-sided bedrock valley. The unconsolidated deposits consist of an alluvial/glaciofluvial silty, coarse-grained unit predominately deposited on the North Plateau and an underlying sequence of up to three fine-grained glacial tills of Lavery, Kent, and Olean ages, which are separated by stratified, interstadial, fluvio-lacustrine deposits. These fluvio-lacustrine sediments are underlain by the upper Devonian shales and interbedded siltstones of the Canadaway and Conneaut Groups. The uppermost portion of these bedrock units is weathered and fractured, allowing groundwater flow. These strata generally dip southward at about 5m/km.

Different stratigraphy is encountered on the North and South Plateaus. Stratigraphy on the North Plateau in descending order is as follows: alluvial/fluvial sand and gravel unit, Lavery till (silty clays), Kent recessional sequence (kame-delta and lacustrine deposits), Kent till (silty clays), and shale bedrock. The Lavery till below the North Plateau also contains the Lavery till-sand, a lenticular unit of limited extent that is not continuous within the subsurface. On the South Plateau the stratigraphy is as follows in descending order: weathered Lavery till, unweathered Lavery till, Kent recessional sequence, Kent till, and bedrock. The weathered Lavery till is an extensively weathered and fractured zone commonly extending to depths up to 15 ft (5 m) from grade, at which depth the till becomes unweathered.

Three permeable units with hydraulic conductivities significantly higher than the clay tills are considered most vulnerable to contamination from past and present site activities. These include, from uppermost to lowest layers:

- the alluvial/fluvial sand and gravel unit, which is an alluvial fan partially, overlying a glacio-fluvial deposit. These two units together overlie the Lavery till on the North Plateau.

- the intra-Lavery "till-sand," which is a lenticular layer of sand of limited areal extent on the North Plateau within the Lavery till.

- the Kent recessional sequence, a series of ice-recessional, interbedded lacustrine-kame delta deposits that immediately underlie the Lavery till. This sequence thickens toward the east from the main plant area, and facies changes are common.

Although the sand and gravel unit is composed of two distinct deposits, it is usually considered one unit. The Lavery till-sand was not specifically identified in previous studies as a potential water-bearing unit.

On the North Plateau, recharge in the form of precipitation is discharged via storm runoff, evapotranspiration, or infiltration into the sand and gravel unit. This infiltration percolates downward to the unconfined water table, which flows generally toward the northeast. The surficial sand and gravel unit also is recharged by inflow from contact with fractured bedrock west of the site. Discharge from this unit flows into Erdman Brook and Frank's and Quarry Creeks. The sand and gravel aquifer is bounded at its base by the Lavery till. A very small fraction of the water in the surficial sand unit migrates downward into the Lavery till, where it moves slowly downward towards the underlying Kent recessional sequence.

The South Plateau lacks the surficial sand and gravel unit, thereby directly exposing the Lavery till to extensive subaerial weathering. Within the weathered Lavery till, some horizontal groundwater flow within the fracture network emerges as seeps along stream valley walls. A small amount of water in the weathered Lavery till migrates downward into the unweathered Lavery till where it flows vertically downward towards the Kent recessional sequence. The dense unweathered Lavery till inhibits the infiltration of a large volume of precipitation that contacts the South Plateau; most precipitation leaves as runoff and evapotranspiration. The Kent recessional deposits also receive some recharge from the fractured bedrock where it contacts the unit just west of the WVDP.

3.0 GROUNDWATER DETECTION MONITORING

The WVDP uses both federal and state technical guidelines to establish groundwater monitoring networks around the SSWMUs and other areas of potential contamination. In reviewing possible monitoring well locations for individual SWMUs, it was not practical to monitor each SWMU separately where two or more SWMUs were close together. Therefore, the concept of a SSWMU was developed to support groundwater monitoring for the RFI. Eleven SSWMUs were identified on the WVDP in the RFI Work Plan and the final approved RFI Report recommended continued groundwater monitoring of six SSWMUs under the WVDP-239, *Groundwater Monitoring Plan*; however, other areas continue to be monitored for indicator parameters.

The EPA's *Groundwater Monitoring Technical Enforcement Guidance Document* (TEGD) (EPA, September 1986) specifies minimum construction and placement criteria that govern well installation and identifies analytical and sampling protocols for monitoring SWMUs. The WVDP groundwater monitoring program was expanded in 1989-1990 by greatly increasing the number of wells. Monitoring data from this expanded program was evaluated and used to support the RFI. Wells constructed during the 1989-1990 expansion were designed predominantly to specifications provided by the TEGD for groundwater monitoring to support the characterization of SWMUs as part of the RFI required under the RCRA §3008(h) Consent Order for the WNYNSC. These groundwater monitoring wells are also used in WVDP site characterization of subsurface glacial stratigraphy, groundwater geochemistry, groundwater contaminant migration pathway evaluation, and off-site receptor analysis.

Because many of the SSWMUs are downgradient of other SSWMUs, some upgradient wells may not reflect true background conditions. In some cases this could lead to misleading indications of groundwater contamination from the monitored SSWMU when actual contamination is from an upgradient source. Therefore, separate background wells that are upgradient of all SSWMUs were designated. On the North Plateau, wells 301, 401, and 706 were used together to represent background conditions for the sand and gravel layer; well 402 represents background conditions for the Lavery till-sand; and well 405 represents background conditions for the unweathered Lavery till. On the South Plateau wells 901 and 1008C represent background conditions in the Kent recessional sequence and the weathered Lavery till, respectively.

In 2004, the WVDP completed construction of the Remote-Handled Waste Facility (RHWF) in the far northwestern corner of the North Plateau, upgradient of wells 706 and 405. This facility will be used to remotely decontaminate, size-reduce, and package radioactively contaminated materials from the WVDP generated during D&D activities. Therefore wells 706 and 405 can no longer be considered true “background” locations. New wells were installed during the summer of 2003 in the vicinity of the RHWF to serve as background monitoring points and to monitor groundwater conditions upgradient and downgradient of the RHWF. Two of the four new wells (WNW1301 and WNW1302) will monitor background conditions in the unweathered Lavery till and the sand and gravel unit, respectively. These wells also monitor upgradient conditions for the RHWF. The remaining two new wells (WNW1303 and WNW1304) will serve as downgradient monitoring locations in the unweathered Lavery till and the sand and gravel unit, respectively, for the RHWF. Wells 706 and 405 will now be designated as downgradient monitoring locations for the RHWF.

In May 1995 a thorough review of the WVDP groundwater monitoring program was conducted. The program was reviewed with the objective of tailoring the groundwater monitoring program to address appropriate site-wide monitoring parameters, as well as constituents of concern specific to individual SSWMUs. This review (i.e., *Groundwater Monitoring Program Review*) was performed with the understanding that the groundwater monitoring program relative to the RCRA §3008(h) Consent Order would evolve as the RFI reports were finalized. This updated WVDP Groundwater Monitoring Program was finalized in May 1995 and implemented during the third quarter 1995 sampling round. Changes to the program resulting from Agency review of the RFI Reports and ongoing review of monitoring results have also been made.

As many of the analyzed metals naturally occur in groundwater, metal concentrations in aqueous samples were evaluated with respect to background or naturally occurring conditions and regulatory guidance values. For analyses completed prior to and during the RFI, observed metals concentrations in groundwater were compared to the proposed 40 Code of Federal Regulations (CFR) Part 264 Subpart S action levels and background concentrations using a statistical analysis method to address the natural variability issue. These data were evaluated using Nationwide Groundwater Information Tracking System/STATistical Analysis System (GRITS/STAT) software (EPA, November 1992). In constructing confidence intervals the GRITS/STAT software uses a one-sided, 99% confidence level. Application of GRITS/STAT in the RFIs consisted of taking the numerical output from GRITS/STAT and creating a graphic display of the two-tailed intervals for both background and downgradient wells chosen to evaluate particular SSWMUs. In doing so, the upper confidence limit for background has been treated as the background concentration. Significant evidence of exceedance has been defined as a lower limit from a downgradient well that exceeds the upper limit for background.

Wells with confidence levels overlapping the confidence intervals from the combined background wells are considered to have concentrations similar to background wells. Wells with confidence intervals having lower limits exceeding the upper limits of confidence intervals from background wells statistically indicate that groundwater concentrations in these wells are not within background intervals.

The variability of metals concentrations in site groundwater can be related to the variability of metals concentration in site soils. Since many of the metals occur naturally, concentrations in both soil and groundwater inherently are highly variable across the WVDP as is the case for most soils, in general. To address this variability, the RFI soil sampling program identified background surface and subsurface locations to establish site background metals concentrations in soil per NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046: *Determination of Soil Cleanup Objectives and Cleanup Levels* (NYSDEC, January 1994). Soil borings drilled to support the RFI activities were sampled for Target Analyte List (TAL) metals to establish background soil concentrations, as well as to compliment groundwater analytical data. Evaluation of the RFI soil data for metals determined that due to the wide range of natural variability inherent on the site, a metals result from any soil/sediment sampling location was not considered to exceed its background concentration/TAGM 4046 recommended soil cleanup level unless it was at least three times greater than the highest concentration measured at the background location.

All analyses (i.e., Target Compound List [TCL] volatile organic compounds [VOCs], semivolatile organic compounds [SVOCs)], pesticides, and polychlorinated biphenyls [PCBs], and TAL metals) of groundwater samples, collected as a part of the updated WVDP Groundwater Monitoring Program since the RFI, are compared directly with NYSDEC's Technical Operational Guidance Series (TOGS) 1.1.1: *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (class GA groundwater) (NYSDEC, June 1998) where applicable, and to site background. Groundwater data presented in this report include all positive detections of analytes from the monitoring wells and parameters recommended in the final RFI reports collected since the RFI. Beginning in 1996, the WVDP has provided NYSDEC with the quarterly monitoring results and an exception report for RCRA groundwater monitoring results in accordance with the WVDP Groundwater Monitoring Plan.

3.1 Chromium and Nickel Evaluation in Groundwater

A metals-sampling investigation was performed from the second-quarter 1997 through the first-quarter 1998 to test the effects of modified sampling equipment and methodology on measured concentrations of chromium and nickel. This investigation was prompted because of the elevated concentrations and wide variability in total chromium and nickel concentrations measured in wells of the sand and gravel unit. The spatial and temporal randomness of the concentrations suggested the source was not related to a release from a SWMU, but may be caused by corrosion of the stainless steel well materials and the subsequent sorption of the metal ions to sediment particles entrained in groundwater samples collected from the wells.

The modified equipment and sampling techniques used during the investigation were intended to minimize turbulence in each well and reduce the amount of sediment entrained in the subsequent sample. This resulted in reduced chromium and nickel concentrations measured in the modified wells. Sampling results from the control group did not show reductions in metals concentrations. The lower chromium and nickel concentrations reported from the test wells during the pilot program are believed to be more representative of actual groundwater conditions. Based on this evidence, the WVDP proposed eliminating chromium and nickel monitoring at wells used in this study after the fourth-quarter 1998 (September 1998) sampling period. The results of this study were documented in a report entitled, *Evaluation of the Pilot Program to Investigate Chromium and Nickel Concentrations in Groundwater of the Sand and Gravel Unit* (Dames & Moore, June 1998), which was transmitted to NYSDEC on July 2, 1998. This report was approved by NYSDEC at the RCRA §3008(h) quarterly meeting in September 1998 (WVNSCO; DW:1998:1361).

3.2 Groundwater Elevation Contours

Groundwater levels at the WVDP are measured quarterly in accordance with WVDP-239. Groundwater contours for the Sand and Gravel and the weathered Lavery till prepared from June 2004 water levels are presented on Figure 3-1.

To further support the information presented in this document, Figure 3-2 has been prepared to present the RFI sampling locations. These locations include surface or shallow soil sampling locations, soil boring locations, sediment sampling locations, and historical and current WVDP monitoring well locations (except those that have been decommissioned).

3.3 Potential Receptors and Pathway Assessment

Groundwater in the sand and gravel unit flows northeastward towards seepage discharge points along the banks of the surrounding streams. Since the sand and gravel unit is hydraulically and geographically isolated from off-site groundwater drinking supplies, surface waters are the principal pathway for off-site migration of contaminants originating in groundwater. All surface water drainage from the North Plateau is to Quarry Creek, Erdman Brook, and Frank's Creek. These creeks drain into Buttermilk Creek, which flows into Cattaraugus Creek approximately 2.6 mi (4.2 km) to the northwest. Access to Buttermilk Creek is restricted and human exposure to the waters of Cattaraugus Creek is limited primarily to recreational use and sport fishing. Neither Buttermilk Creek nor the sections of Cattaraugus Creek downstream of the WNYNSC to Lake Erie are used regularly as a source of potable water.

Exposure to soil potentially containing hazardous constituents via dermal contact or inhalation of dust and particulates is expected to be minimal since public access to the WVDP premises is restricted. The transfer of hazardous constituents to humans through consumption of agricultural products and livestock grown or grazed on this land is not a viable exposure route under current land-use conditions. Other potential pathways include consumption of game animals that include the WNYNSC in their range. Deer are the most plentiful species of game animal present on the WNYNSC. Beginning in 1994, NYSERDA has coordinated controlled deer hunting on the WNYNSC. The WVDP routinely analyzes venison from the WNYNSC for concentrations of radioactivity as part of its environmental monitoring program. The concentration of radioactivity in deer has traditionally been at or below background concentrations.

Since the general population's access to the WVDP is restricted and the hydrogeologic setting is somewhat isolated, the general population surrounding the WVDP is unlikely to be a potential receptor of contaminants. The shortest distance from the WVDP fenceline to the WNYNSC boundary is approximately 1 mi (1,600 m) to the northeast, and the nearest off-site residence is located about 1.1 mi (1,700 m) to the northeast. The closest point of general public access to the WVDP is Rock Springs Road, which traverses the WNYNSC 1,300 ft (400 m) to the west. The population within a 10-mi (16-km) radius of the WNYNSC encompasses parts of both Cattaraugus and Erie counties. (See *Volume 1, Introduction and General Site Overview* [WVDP-RFI-017, May 1994], for more detailed demographic information.) In addition, the WVDP is geographically and hydraulically isolated from public and private drinking water supplies; Cattaraugus Creek is not used as a source of potable water; and the land associated with the WVDP is not used for agriculture, animal husbandry, or hunting.

4.0 SUMMARY OF SUPER SOLID WASTE MANAGEMENT UNITS (SSWMUs) HISTORICAL AND CURRENT CONDITIONS

4.1 SSWMU #1 Low-Level Waste Treatment Facility

SSWMU #1, identified as the Low-Level Waste Treatment Facility (LLWTF) was the original low-level radioactive wastewater management system constructed by NFS in 1965. It initially consisted of three lagoons, one interceptor, and a neutralization pit. Portions of this unit, identified as individual SWMUs, were grouped together into a SSWMU for evaluation in the RFI. The features that make up SSWMU #1 are shown on Figure 1-1. SSWMU #1 is currently composed of three SWMUs and their associated equipment (i.e. wastewater transfer lines):

- SWMU #3 - Lagoon 1,
- SWMU #4 - Lagoons 2, 3, 4, and 5,
- SWMU #17/17a/17b - the former LLWTF building (O2 Plant), neutralization pit, interceptors, and new LLW2 building.

Upon completion of operations, most of these units, which are Clean Water Act (CWA) treatment units, will be closed in accordance with the New York State Pollutant Discharge Elimination System (SPDES) permit and the regulatory requirements of Title 6 of the Official Compilation of Codes Rules and Regulations of the State of New York (6 NYCRR) §750-2.11**.**

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 4, Low-Level Waste Treatment Facility* (WVDP-RFI-021) (WVNSCO, January 1997).

4.1.1 Description and Operational History

SWMU #3: Lagoon 1 is located approximately 600 ft (183 m) east of the Process Building and was constructed at the beginning of NFS operations as an unlined storage basin approximately 82 ft by 82 ft (25 m) by 5 ft (1.5 m) deep, with a capacity of approximately 300,000 gal (1,134,000 L). The bottom of Lagoon 1 is in the sand and gravel unit about 9 ft (2.7 m) above the top of the Lavery till. Because Lagoon 1 was unlined, treated wastewater from the lagoon was able to seep into the surrounding sand-and-gravel unit.

Lagoon 1 began receiving wastes in 1965 from the wastewater interceptors, as well as wastewater from the SDA, HLW Tank Farm, and several yard drains located outside the Process Building. Nine pipelines that were associated with Lagoon 1 included the following:

- a 10-inch-diameter (25.4 cm) carbon steel line that conveyed runoff from the yard on the south side of the Fuel Receiving and Storage (FRS) facility;
- a 2-inch (5.1 cm) polyvinyl chloride (PVC) line that conveyed leachate and precipitation from the SDA burial trenches;
- a 3-inch (7.6 cm) stainless-steel line from the interceptors;
- a 4-inch (10.2 cm) acrylic butadiene styrene plastic line that conveyed runoff from the paved area just east of the Process Building and south of the FRS;
- a 3-inch (7.6 cm) fiberglass-reinforced plastic line that recycled liquids from Lagoon 2 to Lagoon 1;
- an 8-inch (20.3 cm) fiberglass-reinforced plastic line that was used to transfer water from Lagoon 1 to the LLWTF;
- a 4-inch (10.2 cm) PVC line that was the primary discharge from the old interceptor to Lagoon 1;
- a 4-inch (10.2 cm) overflow line between Lagoons 1 and 2; and
- a 2-inch (5.1 cm) carbon steel or stainless-steel line on the north side of Lagoon 1.

In 1984, Lagoon 1 was taken out of service by rerouting, capping, or removing all pipelines to and from the lagoon; removing a 3.5-ft (1.1-m) thick layer of radioactively contaminated sediment for placement in Lagoon 2; and backfilling the lagoon with radioactively contaminated asphalt, soil and vegetation. It was capped with 1.5 ft (0.5 m) of clay and 1.5 ft (0.5 m) of topsoil.

SWMU #4: Lagoons 2 and 3 are unlined basins excavated into the Lavery till geologic unit. These two lagoons have been in use since 1965. From 1965 to 1971, treated wastewater was discharged from Lagoon 1 into Lagoon 2 for discharge to Lagoon 3, and then for discharge to Erdman Brook. In 1972, sediment was removed from Lagoon 3 for burial in the NRC-Licensed Disposal Area (NDA) as part of the LLWTF upgrade.

Both Lagoons 2 and 3 are approximately 280 ft (85 m) long and 195 ft (59 m) wide. Lagoon 2 is 17 ft (5.2 m) deep with a design capacity of 2,400,000 gal (9,072,000 L), while Lagoon 3 is 24 ft (7.3 m) deep with a design capacity of 3,300,000 gal (12,474,000 L). Both lagoons were excavated through the sand-and-gravel down into the Lavery till.

Lagoon 2 receives treated wastewater from the interceptors, as well as wastewater from the NDA interceptor trench, the North Plateau groundwater pump-and-treat system, several yard drains located outside the Process Building, the HLW Tank Farm dewatering well, and, at one time, the SDA lagoons. Lagoon 2 discharges to the O2 plant/LLW2 (updated treatment facility) then to Lagoon 3 which in turn discharges through SPDES-permitted outfall (WNSP001) to Erdman Brook.

Lagoons 4 and 5 were constructed in 1971 (during the construction of the O2 plant) in the alluvial sand-and-gravel deposits and lined with silty till. The function of the lagoons is to act as settling basins for radioactive particulates. Lagoons 4 and 5 are smaller than Lagoons 2 and 3, having a capacity of 240,000 gal (907,200 L) and 185,000 gal (699,300 L), respectively. Lagoons 4 and 5 receive treated wastewater from LLW2 and previously the O2 Plant. In March 1972, Lagoons 4 and 5 overflowed their banks. Standard operating procedures currently prohibit storage of wastewater in excess of 80% of the design capacity to prevent another overflow and consequent migration of treated process water into the adjacent sand-and-gravel unit. In 1974, Lagoons 4 and 5 were identified as potential sources of tritium in groundwater and subsequently were lined with an impermeable membrane which is periodically replaced.

SWMU #17, 17a, 17b: The neutralization pit, a 9-ft (2.7-m) by 7-ft (2.1-m) by 5.5-ft (1.7-m) deep, 6-inch-thick (15.2-cm), below-grade, concrete vessel was constructed in 1965 with a working capacity of 800 gal (3,024 L). From 1965 to 1988, sodium hydroxide was added to this tank to neutralize mildly acidic wastewaters. In 1967, the neutralization pit was re-lined with stainless steel and stainless steel baffles were added to improve mixing of added sodium hydroxide.

The interceptors receive neutralized wastewater discharged from the neutralization pit. The "old" interceptor had an original working capacity of 50,000 gal (189,000 L) prior to the addition of a 1-ft (0.3 m) thick concrete bottom that was added as additional shielding for high radioactivity wastewater. The "old" interceptor is covered with a low-lying steel roof. The "new" interceptor, constructed in 1967, is a 39.5-ft (12-m) by 22.3-ft (6.8-m) by 11.5-ft (3.5-m) deep, below grade, concrete tank lined with stainless steel. It is divided into two compartments (north and south). Each compartment has a 25,000-gal (94,500-L) design capacity and a 21,000-gal (79,380-L) working capacity. The "new" interceptor continues to be used on a routine basis. The "old" interceptor is only occasionally used.

In 1971, the O2 Plant was constructed to remove cesium and strontium from Lagoon 2 wastewater. Effluent from Lagoon 2 was pumped into the O2 Plant through a clarifier, an anthracite filter, and a series of ion-exchange columns for discharge to either Lagoon 4 or 5, which then discharge into Lagoon 3. In 1998, the O2 Plant was removed from service, decommissioned and replaced by a new, updated treatment facility (LLW2).

A French drain and Process Building wastewater transfer lines are present in SSWMU #1, but are not associated with a specific SWMU. The French drain was constructed in 1965 on the northwest side of Lagoons 2 and 3 and the northeast side of Lagoon 3 to divert groundwater flow around, rather than into Lagoons 2 and 3. Until 2001, groundwater collected by the French drain discharged directly to Erdman Brook through SPDES outfall WNSP008. Due to one SPDES permit limit exception for total recoverable lead, the drain was taken out of service in May 2001 by inserting a plug in the outfall. This exception was attributable to an increased lead concentration resulting from decreased flow and siltation within this aging drain line. Wastewater from the Process Building is piped underground via three Duriron process lines encased in concrete. These process lines have been inspected as part of the SPDES program, as discussed in Section 4.1.2.

4.1.2 Wastes Managed at SSWMU #1

RCRA hazardous constituents may potentially be present at the former location of Lagoon 1 and in the adjacent soils and groundwater due to the acceptance of SDA aqueous waste while operational, and asphalt backfill material as fill when Lagoon 1 was taken out of service. In addition, the wastes that are or were managed in the LLWTF originated from the following seven sources:

(1) plant-generated wastewater,
(2) leachate from the SDA (prior to 1982),
(3) precipitation collected in the SDA lagoon (prior to 1991),
(4) groundwater from the NDA interceptor trench,
(5) condensate and groundwater from the HLW Tank Farm and evaporator overheads, and
(6) groundwater from the North Plateau pump-and-treat system.

Detailed chemical and waste-volume data were reported for these six wastewater sources in the 1997 RFI for the LLWTF (WVNSCO, January 1997). A brief summary of the six source areas is provided below.

1) Plant-Generated Wastewater. Various waste streams generated in the Process Building have been discharged to the interceptors and lagoon system of the LLWTF, including: condensates from the acid fractionator (1966-1972), General Purpose Evaporator (1966-1972), and LWTS evaporator (1988 to present); Process Building and utility room floor drains (1965 to present); General Purpose Cell Operating Aisle and Uranium Product Cell (UPC) sumps (1966 to present when not conveyed to HLW tanks); laundry wastewaters (1965 to present); laboratory drains (1965 to present when not conveyed to HLW tanks); and decontamination solutions were used during Process Building clean-up efforts by NFS from 1972 to 1976 and by the WVDP from 1982 to 1987 (decontamination solutions used in vessel flushes were routed to the HLW tanks for management). Historical sampling and process records (e.g., RFI Report Vol. 4 [January, 1997], Table 2-9) did not indicate the presence of any characteristic or listed hazardous or mixed waste in the plant generated wastewater. Presently, liquid laboratory wastes are collected from the laboratory drains, characterized, and dispositioned in accordance with applicable regulatory requirements.

2) SDA Landfill Leachate. Transfer records indicate that about 3,000,000 gal (11,340,000 L) of SDA leachate were pumped to Lagoon 1 between 1975 and 1981 before DOE operations at the WVDP. Sampling and analytical testing of leachate from 13 SDA trenches in 1987 indicated that leachate from some of the trenches met the definition of RCRA characteristic hazardous waste for barium, benzene, and 1,2-dichloroethane. Trench 14 leachate was sampled and analyzed eight times between 1984 and 1992, and benzene, ethylbenzene, toluene, xylene, methylene chloride, 2-methylphenol, phenol, acetone, and 2-butanone were detected.

3) SDA Lagoon Precipitation. Precipitation that had collected in the SDA lagoons was not chemically characterized prior to being managed in the LLWTF between 1975 and 1991.

4) NDA Interceptor Trench Water. Since 1991, groundwater collected in the NDA interceptor trench, an interim measure system to contain migration of groundwater from the NDA, has been routinely transferred for management in the LLWTF. Groundwater collected in the NDA interceptor trench is routinely tested for organics and

radiological parameters. A liquid pretreatment system is in place at the NDA for the removal of organics should they be detected. To date, no organics have been detected.

5) HLW Tank Farm. Six waste streams have historically been transferred to the LLWTF from the HLW Tank Farm: (1) secondary containment condensate, (2) groundwater from a dewatering well and monitoring wells, (3) water that accumulates in construction excavations near the HLW tanks, (4) water used to transport new, unused zeolite resins to the supernatant treatment system, (5) groundwater from the tank underdrain, and (6) purge waters removed from groundwater monitoring wells during sampling. These waste streams are sampled for gross alpha and gross beta activity levels before transfer to ensure that they meet the acceptance criteria for treatment in the LLWTF.

6) North Plateau Pump-and-Treat System. Since November 1995, groundwater contaminated by strontium-90 (Sr-90) has been withdrawn by recovery wells and conveyed to the LLWTF to lower the Sr-90 activity level prior to discharge to the LLWTF lagoons.

Process Sewer Lines: The process lines that discharge to the LLWTF were reviewed as possible sources of radiological contamination as part of the North Plateau Geoprobe investigation. The RFI (WVNSCO, January 1997) evaluated these data and determined that the results did not indicate a problem with leaking lines. After the RFI was completed, WVDP implemented an ongoing program for the evaluation of wastewater treatment and process sewer lines. A detailed investigation of the process sewer lines is currently underway as part of the SPDES program.

Spills: The WVDP maintains a database of spills that have occurred at the site since 1989. The database includes the location of the spill (which is linked to the WVDP geographic information system), whether notifications were required and made, and the cleanup actions that were implemented for each spill. Spill reports are transmitted to NYSDEC each month. There have been no uncontained spills or releases to the environment as a result of waste operations at the LLWTF, with the exception of the laundry line breach (SWMU #45; see discussion in Section 5.21). All spills that did occur in the area of this SSWMU were contained and were cleaned up promptly and appropriately. The wastes, residues, and cleanup materials associated with these spills were collected and dispositioned in accordance with regulatory requirements.

4.1.3 Environmental Characterization

4.1.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: Twenty-one groundwater samples from 19 wells, one outfall, and one seep were collected and analyzed for various contaminant suites quarterly from 1991 through 1993. Thirteen of these wells (WNW8603, WNW8604, WNW8605, WNW0103, WNW0104, WNW0105, WNW0106, WNW0107, WNW0109, WNW0110, WNW0116, WNW0305, and WNW1008C) were sampled and analyzed during the expanded groundwater characterization program. The French drain outfall (WNSP008) and monitoring location WNGSEEP were added to the groundwater evaluation for this RFI. Samples from these locations were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals during the RFI in 1993 and 1994.

Sediment Sampling Program: Historical sampling prior to the RFI was primarily for radiological constituents. In 1982 sediment samples were collected from three locations in Lagoons 1, 2, and 3 for analysis of radiological parameters. In 1984, prior to taking Lagoon 1 out of service, the sediment in Lagoon 1 was again sampled for radiological parameters only. The first RCRA constituent sampling of the lagoon sediments was conducted in late October 1990, when a more comprehensive analysis was done on several near-surface/shoreline sediment samples collected from the banks of Lagoons 2 and 3. Four samples were collected from the shoreline of each of the lagoons. These eight shoreline samples were analyzed for TCL parameters, for Toxicity Characteristics Leaching Procedure (TCLP) metals, and for an expanded list of radiological parameters. As part of this sediment evaluation effort, 25 additional samples (at varying depth) were collected from 13 locations along the perimeter and center of Lagoon 3 to characterize the vertical and horizontal distribution of radionuclides in Lagoon 3 sediments.

The 1990 sampling event was followed by another pre-RFI sediment sampling effort in May 1991 wherein 23 sediment samples were collected from three locations in Lagoon 3 only and were analyzed for TCL parameters and TCLP metals.

Surface and Shallow Soil Sampling Program: During the RFI, shallow (0 – 2 ft; 0 – 0.6 m) soil samples were collected from 12 soil borings noted below for analysis of TAL metals. Surface soil (0.5 ft; 0.2 m) samples were collected from sampling locations SS-3, -4R, -5R, -6R, and-11, associated with SSWMU #1 to evaluate the effect of past site operations. Soil from these locations was analyzed for TCL VOCs and SVOCs, TAL metals, and radiological parameters.

Deep Soil Sampling Program: Twelve deep boreholes (BH-1, -2, -3, -4, -5, -7, -8, -9, -10A, -13, -14, and 33A) were drilled in the LLWTF during the 1993 RFI soil characterization program to characterize hydraulically downgradient conditions from the various units comprising the LLWTF. Boring locations BH-1, -2, -3, and -4 were located downgradient of Lagoons 4 and 5; borings BH-5, -7, -8, and, -9 were associated with Lagoon 1; borings BH-13 and BH-14 were located near the interceptors; and borings BH-10A and BH-33A were associated with Lagoon 2. A total of 27 subsurface soil samples were collected for analysis of TCL VOCs and SVOCs and TAL metals.

Stream Sediment Sampling: Stream sediment sampling conducted during the 1993 site-wide soil characterization program for the RFI was designed to evaluate whether radiological or chemical contaminants were introduced into surface waters at the WVDP. Stream sediment was collected from three locations on Erdman Brook downstream of the gully east of Lagoon 1. The sediment collected from these locations (ST-19, -20, and -21) was analyzed for TAL metals and radioisotopes because they were determined to be the parameters that would most likely indicate a release. ST-19 was also analyzed for SVOCs. The analytical results from these locations were compared to background location ST-26, which is located in Erdman Brook approximately 400 ft (122 m) southwest of the Process Building.

The results of these investigations are summarized in Table 4-1.

4.1.3.2 Post-RFI Environmental Monitoring

Post-RFI monitoring at the LLWTF consisted of groundwater monitoring for VOCs, SVOCs, metals, and radiological parameters. Routine groundwater monitoring results since the RFI indicate that no RCRA hazardous constituents have been detected at levels of concern as discussed below.

Tables 4-2 through 4-4 present detectable groundwater monitoring results for organics and metals collected since the RFI and data collected in accordance with the agency-approved RFI recommended sampling. These data are current through June 2004. These results are compared to NYSDEC's TOGS 1.1.1 groundwater quality standards, as well as to site background, where applicable.

Observed historical and current groundwater conditions are as follows:

Volatile Organic Compounds: No VOCs have been detected above groundwater standards at the three monitoring wells, 110, 111 and 8605 that were recommended for post-RFI sampling (Table 4-2). No detectable VOC concentrations were reported for well 110. Quarterly sampling of additional wells in the area also show no positive detections above TOGS 1.1.1 water quality standards for VOCs since 1995.

Semivolatile Organic Compounds: Since the RFI, no SVOCs have been reported at concentrations above groundwater standards, except for pentachlorophenol (PCP) which was reported at an estimated concentration of 7 micrograms per liter (µg/L) in well 8605 in December 1999 (Table 4-3). PCP was not detected in the duplicate for this sample and has not been detected subsequent to this measurement in 1999. Tributyl phosphate (TBP) continues to be detected in samples from monitoring wells 8605 and 111 at concentrations comparable to or below those presented in the RFI. No TOGS 1.1.1 water quality standards for TBP have been established. Quarterly sampling of additional wells in the area have shown no positive detections above TOGS 1.1.1 water quality standards for SVOCs since 1991

TAL Metals: All metals detected in samples from wells 111 and 8605 since the RFI are tabulated in Table 4-4 with the established site background concentrations and TOGS 1.1.1 water quality standards. Arsenic and mercury have not been detected above regulatory criteria since the RFI. Cobalt, manganese, silver, and thallium were reported above TOGS 1.1.1 water quality standards in well 111, but were below site background concentrations. Aluminum, iron, manganese, and thallium were reported above TOGS 1.1.1 water quality standards in well 8605; however, with the exception of manganese, these analyte concentrations were below site background levels. Iron was the only metal detected above TOGS 1.1.1 water quality standards in both monitoring wells 111 and 8605.

Radiological Parameters: Concentrations in groundwater of the radiological indicator parameter gross alpha at monitoring wells 103, 110, 111, and 8605 have remained stable over the last 12 years (Figures 4-1 and 4-2). There has been a slight increase in the trend for the gross beta concentration at well 103 since the middle of the year 2000. The elevated gross beta concentrations in monitoring well 103 are believed to be due to migration and spreading of the Sr-90 plume from the Main Plant towards the LLWTF and therefore are not associated with SSWMU #1. The gross beta trend from monitoring well 111, immediately downgradient of Lagoon 1, has also been stable, although seasonal fluctuations are apparent (as are also seen in the gross beta data for monitoring well 103). The gross beta trend for well 8605 shows an overall decrease from 1992 to present. The gross beta trend for downgradient well 110 does not indicate the presence of this constituent. The tritium concentration at monitoring well 110 exhibited a slight increase until 1999, but since then has been very stable; however, at monitoring wells 103, 111 and 8605 the tritium concentrations exhibit overall decreasing trends from 1991 to present. These decreasing trends provide support to the conclusions above from the non-radiological data, that there have been no adverse impacts on the groundwater quality originating from SSWMU #1.

4.1.4 Conclusions and Recommendations

The RFI report concluded that no further action was necessary for the LLWTF, except for continued groundwater monitoring downgradient of Lagoons 1 and 2 and the interceptors. These activities have been implemented and continue as discussed in the previous section. The following recommendations of the RFI report were approved by both EPA and NYSDEC in their November 22, 1996 correspondence (Appendix A):

- conduct an investigation into the source of the elevated nickel and chromium;
- continue groundwater monitoring for mercury at wells 111 and 8605 as part of the expanded characterization;
- continued groundwater monitoring downgradient of Lagoons 1 and 2 at wells 111 and 8605 for VOCs, SVOCs, and metals, as well as monitoring well 110 for VOCs annually; and
- collect quarterly samples from well 103 for radiological indicator parameters.

The CWA directs that the SPDES regulations will influence eventual closure of the active treatment units (Lagoons 2, 3, 4, and 5); therefore, no further action under RCRA Corrective Action is anticipated for these units. The groundwater monitoring program implemented after the RFI activities continues to support the results of the RFI by providing data that are below regulatory levels or within site background values. These data collected supports the previous conclusion that continued monitoring is all that is necessary to ensure protection of public health and the environment from any potential contamination originating at SSWMU #1.

4.2 SSWMU #2 Miscellaneous Small Units

SSWMU #2 is situated immediately east of the rail spur about 100 ft (30 m) southeast of the Process Building. This SSWMU, identified as the Miscellaneous Small Units, contains four SWMUs that are identified as follows:

- SWMU #5 - north and south demineralizer sludge ponds;
- SWMU # 6 - solvent dike;
- SWMU #7 - effluent mixing basin; and
- SWMU #10 - paper waste incinerator.

The Miscellaneous Small Units cover approximately 1 acre (0.6 ha) of ground as shown on Figure 1-1. The location and function of the component SWMUs are described in the following subsections.

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 5, Miscellaneous Small Units* (WVDP-RFI-020) (WVNSCO, January 1997).

4.2.1 Description and Operational History

<u>SWMU #5:</u> The north and south demineralizer sludge ponds were built between 1964 and 1965 during construction of the Process Building on the North Plateau. The sludge ponds are two unlined, rectangular basins located southeast of the Process Building. Each pond is 50 ft (15 m) by 100 ft (30 m) and approximately 5 ft (1.5 m) deep. The ponds were constructed to discharge through a weir box and underground piping to a SPDES-permitted outfall.

The demineralizer sludge ponds were designed to receive discharge solutions backflushed from the process water demineralizer and water softener, sludge from the raw-water clarifier, clarified water and filter backwash, and utility room boiler blowdown. Until 1985, only the north pond was used when the effluent mixing basin was brought on line. From 1985 to 1994, only the south pond was used to receive water softener regeneration and clarifier blowdown. The demineralizer sludge ponds have remained inactive since June 1994, as referenced in the RFI Report.

<u>SWMU #6:</u> The Solvent Dike is located on the North Plateau east of the Process Building. It was constructed in 1966 by partially excavating the sand and gravel unit and then building a berm around the excavation. The dike was essentially a holding pond approximately 45 ft (14 m) by 50 ft (15 m) by 4 ft (1.2 m) deep. Runoff from the Solvent Storage Terrace (SST) at the Process Building flowed down a floor drain, through an underground drain line with an outlet to the Solvent Dike. The runoff to the Solvent Dike was composed of precipitation contaminated with radioactive waste solvent, TBP, or n-dodecane that had been spilled at the SST. There was no outlet from the Solvent Dike so any collected water had to evaporate or seep into the soil.

In 1987 the unit was removed from service by removing and packaging the berm and any radioactively contaminated sediment. The excavation was backfilled with clean soil and graded. The drain from the SST was redirected to the interceptor drain.

<u>SWMU #7:</u> The effluent mixing basin lies about 300 ft (90 m) east of the old warehouse and about 650 ft (200 m) southeast of the Process Building. The basin measures 50 ft by 125 ft (15m by 38 m) and is 6.6 ft (2 m) deep. The basin has a Hypalon® liner and is underlain by a sand drain, and was originally part of the site's conventional sewage treatment system. It now serves as the replacement for the demineralizer sludge ponds.

The basin originally had an operating capacity of nearly 250,000 gal (946,250 L). It was placed in service in December 1985 as a Process Building upgrade. Discharge is through a pipe located in the bottom of the basin to the head of the principal gully that drains due eastward to Erdman Brook. The discharge point is SPDES-permitted as outfall 007.

SWMU #10: The waste paper incinerator was constructed on the North Plateau north of Warehouse I. The incinerator was a PLIBRICO Model 1-AGF-260, multiple-chamber retort incinerator. It was mounted on two rails on a concrete pad and had a listed capacity of 290 pounds (118 kilogram [kg]) per hour of combustible material. The incinerator was operated under a NYSDEC-issued permit for air emissions.

The waste paper incinerator was used from 1970 to 1985; the ash was routinely disposed of at the CDDL. Use of the incinerator was discontinued in 1985 and the paper and packaging waste was contracted for disposal off-site. The permit was allowed to expire in 1990 and the incinerator was sealed by the NYSDEC in January 1991 and padlocked to prevent its use. In May 1996, the incinerator was removed from its original location, disassembled, and placed in on-site storage. Since that time there has been no active use of this SWMU.

4.2.2 Wastes Managed at SSWMU #2

SWMU #5: The waste streams and processes associated with the sludge ponds are as follows:

(1) water softener regeneration
(2) clarifier overflow and blowdown
(3) sand filter backwash
(4) boiler blowdown
(5) demineralizer regeneration, and
(6) effluent mixing basin recirculation filter blowdown.

Detailed chemical and waste-volume data were reported for these wastewater sources in the 1997 RFI for the Miscellaneous Units (WVNSCO, January 1997). A brief summary of the six sources is provided below.

1) Water Softener Regeneration. The water softener is a zeolite resin ion-exchange system that exchanges sodium for calcium and magnesium. When the exchange capacity of the resin is exhausted, brine is backflushed through the resin bed and routed to the sludge pond. The spent brine would normally contain calcium, magnesium, sodium, and chloride ions and contain small quantities of zeolite resin.

2) Clarifier Overflow and Blowdown. Clarifier overflow would normally contain flocs and traces of alum, Dearborn 2511 (polyelectrolyte), bentonite, Dearborn 200 (sodium silicate), and lime, along with any other material not completely filtered from the site reservoir water. Chlorine gas (until 1993) and sodium hypochlorite (since 1993) have been added to this water as disinfectants. Clarifier blowdown is similar to overflow except that concentrations of constituents are likely higher.

3) Sand Filter Backwash. Clarified water was directed to sand filters for additional particulate filtering. These filters are periodically backwashed, resulting in a waste flow with characteristics similar to the clarifier overflow.

4) Boiler Blowdown. Continuous surface blowdown and periodic bottom blowdown from the utility room steam boilers remove corrosion products, treatment chemicals, and particulates from steam and condensate system piping. The treatment chemicals used are Dearborn 66 (sodium sulfite) and Dearborn 653 (ethylenediaminetetraacetic acid [EDTA]).

5) Demineralizer Regeneration. Continuous surface blowdown and periodic bottom blowdown from the utility room steam boilers remove corrosion products, treatment chemicals, and particulates from steam and condensate system piping. The treatment chemicals used are Dearborn 66 (sodium sulfite) and Dearborn 653 (EDTA). The

demineralizers further purify the clarified water by ion-exchange for uses in the plant requiring very pure water. Demineralizer regeneration involves backflushing with 93% sulfuric acid and 50% sodium hydroxide to exchange Na^+, Ca^{++}, Mg^{++}, SO_4^{2-}, and Cl^- ions for H^+ and OH^- ions.

6) Effluent Mixing Basin Recirculation Filter Blowdown. The blowdown from this filter could reasonably be expected to contain traces of all of the above-listed utility room constituents, filtered solids from the site treatment plant effluent, and airborne debris that settled into the open effluent mixing basin.

Reviews of Material Safety Data Sheets (MSDSs) for all materials known to have been or suspected to have been discharged to the ponds contain no mention of any regulated RCRA hazardous waste constituents.

SWMU #6: The three tanks on the SST were the waste source for the Solvent Dike. These tanks contained a radioactively contaminated waste solvent mixture of TBP and n-dodecane. MSDSs for each of these materials list no RCRA-regulated hazardous constituents as per 6 NYCRR §371, Appendix 23. A spent radioactively contaminated mixture of n-dodecane/TBP is the only known material present in the contaminated run-off waste stream that went to the solvent dike.

SWMU #7: With the addition of Dearborn 2005, a neutralizing amine, the effluent mixing basin received the same waste flows as the sludge ponds. As of March 1994, the basin has received all of the former sludge pond inflow and has functioned as a settling basin.

Spills: Review of the WVDP spill data base indicates that there have been no spills of any type at this location.

4.2.3 Environmental Characterization

4.2.3.1 Pre-RFI and RFI Environmental Monitoring

Four sediment samples were collected from the solvent dike and analyzed for Extraction Procedure (EP) Toxicity (i.e., predecessor to the TCLP) metals in 1986. In June 1988, five sediment cores were collected from the sludge ponds for laboratory analysis of radiological parameters and TCLP metals. Two composite soil samples were collected southeast of the incinerator in July 1990 for TCLP analysis. Also in 1990, samples of incinerator ash were analyzed for TCLP parameters. The results of these analyses were below regulatory levels. In 1991, routine groundwater monitoring was initiated for monitoring wells adjacent to the sludge ponds. RFI sampling activities (soil, groundwater, and sediment) for the demineralizer sludge ponds were performed in 1993 and 1994. The results of these investigations are summarized in Table 4-5.

4.2.3.2 Post-RFI Environmental Monitoring

Consistent with the RFI approval letter dated November 4, 1996 (Appendix A) from NYSDEC and EPA, quarterly groundwater monitoring has been performed for SSWMU #2 since December 1995 in accordance with WVDP-239, *Groundwater Monitoring Plan*. This monitoring consists of sampling for radiological indicator parameters (gross alpha, gross beta, and tritium), pH, and specific conductance.

Figure 4-3 presents the results of post-RFI groundwater sampling and analysis for radiological indicator parameters at monitoring wells 204, 205, and 208. As Figure 4-3 shows, the trends for gross beta and tritium concentrations are historically stable or decreasing for these wells, with the exception of gross beta at well 208. The gross beta plume (i.e., Sr-90 plume) at well 208, which shows a slight increase in gross beta concentrations, is due to the gross beta plume that is currently being mitigated by the North Plateau Groundwater Recovery System.

4.2.4 Conclusions and Recommendations

The RFI Report concluded that no further action was deemed necessary for this unit. Review of historical records, results of investigations, and sampling and analysis at this unit indicate that there were no releases of hazardous constituents from this unit while it was in operation. The RFI established there were no hazardous constituents present in the unit above regulatory levels and there were no impacts on the environment from its operation. The EPA and NYSDEC reviewed the RFI report and concurred with the conclusion of no further action for SSWMU #2. In their letter dated November 4, 1996 (Appendix A), the Agencies further indicated that "Therefore, continued groundwater monitoring required by the WVDP Groundwater Monitoring Plan is sufficient."

As discussed in Section 4.2.3, quarterly groundwater monitoring was implemented in the first quarter of 1996 and has continued to the present. The results through September 2004 suggest no indication of a release of hazardous constituents, as indicated by the trends of radiological indicator parameters. Therefore, the determination of no further action should remain in effect for this SSWMU and RCRA Corrective Action should be considered as complete for all of the individual SWMUs.

4.3 SSWMU #3 Liquid Waste Treatment System

SSWMU #3, identified as the Liquid Waste Treatment System (LWTS), was originally designed to process the low-level radioactive supernatant associated with the approximately 600,000 gal (2,271,000 L) of liquid HLW stored in tank 8D-2. This liquid had remained from NFS nuclear fuel reprocessing operations. Portions of the Integrated Radioactive Waste Treatment System (IRTS) identified as individual SWMUs were grouped together into a SSWMU for evaluation in the RFI. The features that make up SSWMU #3 are shown on Figure 1-1. SSWMU #3 is currently composed of two SWMUs and the Sealed Rooms:

- SWMU #18/18a – Liquid Waste Treatment System
- SWMU #22 – Cement Solidification System (CSS)
- Sealed Rooms – Located in the Process Building (Note that the Sealed Rooms are discussed in Section 4.13).

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 10, Liquid Waste Treatment System* (WVDP-RFI-026) (WVNSCO, May 1997).

4.3.1 Description and Operational History

SWMU No. 18/18a: The LWTS, constructed between 1986 and 1988 occupies several decontaminated extraction cells in the south end of the Process Building, which is located in the center of the North Plateau. The LWTS operates as an interim status waste treatment unit. A high-efficiency evaporator is one of the principal components of the LWTS. Other primary components or tanks of the LWTS are housed in three cells: Extraction Cell #3 (XC-3), Product Purification Cell (PPC), and UPC. The primary valves, piping, and ancillary equipment associated with LWTS are housed in the Extraction Chemical Room (XCR), Lower Warm Aisle (LWA) pump niches, Lower Extraction Aisle (LXA), Upper Extraction Aisle (UXA), and Uranium Loadout (ULO) area. The floors of these cells are lined with stainless steel pans and the walls are coated with carbolene.

The LWTS has been used since May 1988 to process (concentrate) the low-level fraction of the supernatant (from the Supernatant Treatment System [STS]) and sludge wash solutions (from the Sludge Mobilization System [SMS]), as well as the melter-feed preparation steam condensates which were generated during the vitrification of HLW. The LWTS produced a distillate waste stream and a radioactive concentrates stream. The radioactive concentrates stream was produced by the high-efficiency evaporator of the LWTS. The distillate stream was transferred to the LLWTF for further treatment while the radioactive concentrates stream was transferred to the CSS for processing.

Treated liquid radioactive waste from the STS or SMS was transferred to a feed tank (5D15B) in the UPC. This liquid was transferred to the LWTS evaporator in XC #3. As indicated above, the high-efficiency evaporator produces two waste streams: a distillate waste stream and a concentrates waste stream. The distillate is transferred to a zeolite ion-exchanger in XC #3 that uses naturally occurring hydrous alumino-silicate minerals to remove residual cesium-137 (Cs-137) and Sr-90. Once the distillate passes through the ion-exchanger, it is sent via the interceptors to the LLWTF for additional treatment before it is discharged through SPDES-permitted outfall 001 to Erdman Brook. The evaporator concentrates (bottoms) are pumped to tanks 5D15-A1 and 5D15-A2 in the UPC and then to the CSS where they have been stabilized in Portland cement.

The LWTS historically supported the processing of mixed wastes for the WVDP vitrification activities that concluded in September 2002. To support the vitrification activities, a mercury abatement system (including a mercury exchange column) was installed to treat overhead liquids generated from the evaporator. These liquids were then transferred to the LLWTF for final treatment. Activities for decontaminating the vitrification and support facilities were then initiated. The LWTS operation concentrated, through evaporation, the Process Building liquid waste streams such as the decontaminated tank 8D-1, 8D-2, and 8D-3 solutions Concentrator Feed Makeup Tank (CFMT) overheads and treated the concentrates for future solidification. The LWTS also supports the volume reduction of RHWF (SWMU #47) waste generated during operational activities.

SWMU #22: The CSS, constructed in the 1986-1988 time period, occupies space on two floors of the 01-14 Building next to the southwest corner of the Process Building. The CSS is operated as an interim status waste treatment unit. Included in the CSS are radioactive and nonradioactive waste processing operations. Radioactive waste-processing operations in the CSS occurred on the first floor of the 01-14 Building in the Waste Dispensing Cell, which contains a waste dispensing vessel, and in the Process Cell, which contains the waste dispensing pump, two high-shear mixers, and drum-handling equipment. Nonradioactive operations were conducted on the second floor of the 01-14 Building, which houses the gravimetric cement feeder. The accompanying cement bulk storage silo (approximately 12-ft-diameter [3.7-m]) and associated equipment are located on a steel platform outside the south side of the 01-14 Building. An approximate 15 ft (4.6 m) by 25 ft (7.6 m) drum load-out area added to the west side of the 01-14 Building is also part of the CSS.

The CSS was initially used from 1987 to 1995 to solidify liquid HLW supernatant and sludge wash solutions that were previously evaporated in the LWTS. The CSS operations were performed in an approximate 40 ft (12.2 m) by 40 ft (12.2 m), typically across four floor/plan elevations. The concentrates were pumped to tanks 5D-15A1 and 5D-15A2 in the UPC and then to the CSS. In the CSS the concentrates were blended with a specially formulated dry Portland Type I cement mixture stored in the cement silo constructed on the south side of the 01-14 Building and with gravity feed from the second floor. The radioactive waste-cement mixture was then poured into 71 gal (269-L), plastic-lined square steel drums and produced a solidified waste form. Approximately 20,000 drums of nonhazardous, cement-solidified low-level waste (LLW) were produced by end of 1995 and are currently stored in the RTS Drum Cell (SSWMU #10/SWMU #21).

During 2004, the CSS has been used to treat sodium-bearing waste (SBW) generated during tank farm operations. Approximately 11,200 gal (42,392 L) of concentrated SBW was generated that underwent treatment into a cement-solidified waste form meeting the Land Disposal Restriction (LDR) treatment standards of 6 NYCRR §376.4. Future use of the CSS may include stabilization of LWTS concentrates from tank 8D-3 and/or the RHWF Operations.

4.3.2 Wastes Managed at SSWMU #3

SWMU #18/18A: Review of operating records indicates that NFS did not manage RCRA-listed hazardous waste in the cells that became operational components of the LWTS. NFS decontaminated these cells after reprocessing activities ended. The vessels and the cells were flushed with decontamination solutions and any material remaining within the vessels after reprocessing would have been routed along with the decontamination solutions to the HLW tanks for management.

The LWTS and CSS, as successive in-line processing steps, have processed liquid radioactive mixed wastes (supernatant and sludge wash solutions and SBW) that exhibit the following RCRA hazardous toxicity characteristics: barium (D005), cadmium (D006), chromium (D007), mercury (D009), selenium (D010), and silver (D011). These waste characteristics were derived from the liquid radioactive waste stored in tank 8D-2 and from the thorium reduction extraction process (THOREX) waste transferred to tanks 8D-2 from 8D-4. To prevent the precipitation of thorium in tank 8D-4, the THOREX waste was not neutralized after it was produced. However, the process of transferring the THOREX to tank 8D-2 resulted in a plutonium uranium reduction extraction process (PUREX)/THOREX mixture that did not display the RCRA characteristic of corrosivity. This mixture was washed and the resultant wash water was processed through the STS. The THOREX waste was identified as exhibiting the following RCRA-defined hazardous waste characteristics: corrosivity (D002), barium (D005), cadmium (D006), chromium (D007), selenium (D010), and silver (D011).

RFI review of the LWTS cells indicates that no RCRA-listed hazardous waste was managed during NFS operations. However, the following chemicals were used to support the NFS nuclear fuel reprocessing operations: n-dodecane, TBP, fresh nitric acid, recovered nitric acid containing mixed fission products, ferrous sulfamate, hydroxylamine nitrate, sodium nitrate, sodium bicarbonate, and a 35% by weight solution of hydrazine. Also, NFS used the following chemicals to decontaminate various LWTS cells: sodium hydroxide, potassium permanganate, potassium dichromate, oxalic acid, citric acid, tartaric acid, paint remover, and sodium nitrilotriacetate.

SWMU #22: The mixed radioactive hazardous wastes (i.e., metals) in the liquids processed in the LWTS, as described above, were concentrated through evaporation and the concentrates were transferred to the CSS; therefore, barium (D005), cadmium (D006), chromium (D007), mercury (D009), selenium (D010), and silver (D011) also apply to the CSS. The concentrated liquid radioactive waste presented to the CSS for processing is a mixed radioactive hazardous waste exhibiting RCRA-defined hazardous toxicity characteristics for metals. In the CSS, the waste was stabilized with Portland cement and stored in 71-gal (269-liter) steel drums. Once stabilized in Portland cement, the solid waste form no longer exhibits RCRA hazardous waste characteristics.

Spills: Review of the WVDP spill data base indicates that there have been no spills associated with the LWTS and CSS that have been released to the environment (i.e., any spills that have occurred have been contained within stainless-steel liners and transferred to appropriate tanks, as necessary).

4.3.3 Environmental Characterization

4.3.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: Since 1991, groundwater in the sand and gravel unit in the vicinity of SSWMU #3 has been routinely sampled for groundwater quality parameters. Nine wells, including the background wells, were used for this monitoring. During the 1993/94 sampling activities, three of the nine wells were sampled and analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, TAL metals and radiological indicator parameters.

Shallow Soil Sampling: Shallow soil was collected as part of the deep soil sampling program. Seven samples were collected from a depth of 0 to 2 feet for subsequent chemical analysis.

Deep Soil Sampling Program: In the 1993 site-wide soil characterization program, 11 deep boreholes, one upgradient and seven down gradient, were drilled to assess whether RCRA hazardous waste or hazardous constituents have been released from SSWMU #3 to the sand and gravel unit. The other three boreholes were intended to characterize the underlying shallow (fractured) Lavery till.

The results of these investigations are summarized in Table 4-6.

4.3.3.2 Post-RFI Environmental Monitoring

Post-RFI monitoring at the LWTS has consisted of groundwater monitoring for radiological parameters at monitoring wells 103, 204, 301, 401, 408, and 8609 and VOCs at wells 103, 408 and 8609. Routine groundwater monitoring results since the RFI indicate that no RCRA hazardous constituents have been detected at levels of concern as discussed below.

Table 4-7 presents positive detections of VOCs in groundwater samples collected since the RFI and data collected in accordance with the agency-approved RFI recommended sampling. These data are current through June 2004 and are compared to NYSDEC's TOGS 1.1.1 groundwater quality standards

Observed historical and current groundwater conditions are as follows:

Volatile Organic Compounds: Of the three wells monitored for VOCs at this SSWMU, detectable levels of VOCs have only been reported at wells 103 and 8609. However, these concentrations have all been reported below TOGS 1.1.1 groundwater quality standards and have been somewhat sporadic.

Radiological Parameters: Concentrations in groundwater of the radiological indicator parameter gross alpha at monitoring wells 103, 301, 401, 408, and 8609 have remained stable over the last 12 years (Figures 4-4 and 4-5). There has been a slight increase in the trend for the gross beta concentration at wells 103, 408, and 8609 since the middle of the year 2000. Elevated gross beta concentrations in monitoring wells 103, 408, and 8609 have been reported and are believed to be due to migration and spreading of the Sr-90 plume from the Main Plant towards the LLWTF and therefore are not associated with SSWMU #3. Gross beta trends for monitoring well 408 near the middle of the plume (Figure 4-6) shows that after an increasing trend from 1993 through 1999, the gross beta concentrations have been decreasing. Tritium concentrations at the above referenced monitoring wells all exhibit stable or slightly decreasing trends from 1991 to present. These decreasing trends provide support to the conclusions above from the non-radiological data, that there have been no adverse impacts on the groundwater quality downgradient of SSWMU #3.

4.3.4 Conclusions and Recommendations

The results of the RFI did not indicate the presence of a release of RCRA-regulated hazardous constituents or waste from SSWMU #3. The RFI report concluded that no further action was necessary for the LWTS, except for continued groundwater monitoring at wells 103, 204, 301, 401, 408, and 8609. NYSDEC and EPA concurred with the conclusions and recommendations of the RFI Report in their March 6, 1997 correspondence (Appendix A) and added "…the only further action necessary for this unit are continued groundwater monitoring required by the WVDP Groundwater Monitoring Plan."

These activities have been implemented and continue as discussed in the previous section. The recommended post-RFI groundwater monitoring data continue to support the conclusion of the RFI that there has not been any release of RCRA-regulated hazardous constituents to the environment from SSWMU #3.

The LWTS (SWMU #18/18a) and CSS (SWMU #22) are active interim status hazardous waste management units and the continued operation will be handled according to RCRA operating requirements. Additionally, these units are subject to RCRA closure under interim status or final status standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMUs #18/18a and 22.

4.4 SSWMU #4 High-Level Waste Storage and Processing Area

SSWMU #4 consists of various pre-existing and newly constructed components, systems and facilities used to accomplish the WVDP's mission of HLW solidification. The three SWMUs associated with SSWMU #4 are:

- SWMU #13 - High-Level Waste Tank Farm,
- SWMU #19 - Supernatant Treatment System,
- SWMU #20 - Vitrification Facility (VF).
- SWMU #12/12a – Vitrification Test Facility Waste Storage Tanks

Facilities included in SSWMU #4 that functioned as part of commercial operations prior to the WVDP that have been modified to support HLW processing also include the Analytical & Process Chemistry (A&PC) Hot Cells, the Chemical Crane Room, the Chemical Process Cell (CPC) (also known as the High-Level Waste Interim Storage Facility), the Equipment Decontamination Room, the Process Chemical Room, the Process Sample Cells, the Chemical Process Cell Viewing Aisle, and the Chemical Operating Aisle.

The discussion of SWMU #12/12a, Vitrification Test Facility Waste Storage Tanks is included in Section 5.1.

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 4, High-Level Waste Storage and Processing Area* (WVDP-RFI-024) (WVNSCO, April 1997).

4.4.1 Description and Operational History

SWMU #13: The HLW Tank Farm consists of four below-ground tanks. Tanks 8D-1 and 8D-2 are contained in individual concrete vaults. They are situated 160 ft (48.8 m) north of the VF, which is adjacent to the Process Building. Tanks 8D-3 and 8D-4 are contained in a common concrete vault, situated approximately 70 ft (21.3 m) north of tank 8D-1.

Tank 8D-2 was used to hold radioactive HLW until it was solidified for disposal. All four tanks are operated as interim status waste storage and treatment units. The waste was the byproduct resulting from the solvent extraction process that separated uranium and plutonium from spent nuclear fuel. In this process, spent nuclear fuel was leached from its cladding with hot nitric acid. Using an n-dodecane/TBP solvent, the uranium and plutonium were then separated from the fission products, which remained in the aqueous phase. The nitric acid waste solution was then neutralized by adding sodium hydroxide to allow storage in a carbon steel tank. The neutralizing reaction formed insoluble metal hydroxides that accumulated at the bottom of the storage tank as a precipitate. The supernatant liquid was essentially a saturated solution of sodium nitrate. The waste in tank 8D-2 thus consisted of two phases, a supernatant and a precipitate. After the supernatant was pumped from tank 8D-2, the sludge was repeatedly washed to remove salts. The sludge wash solution was also removed and sent to the STS for treatment. The HLW precipitate was then stabilized by vitrification for eventual off-site disposal.

Tanks 8D-1 and 8D-2 provided backup storage for each other. As part of HLW processing, tank 8D-1 was used to contain spent zeolite from the STS and STS processing equipment. The spent zeolite was transferred to tank 8D-2 where it became part of the vitrification waste feed.

Tanks 8D-1 and 8D-2 are nearly identically constructed. Each tank is 70 ft (21.3 m) in diameter and 27 ft (8.2 m) high. Each has a maximum capacity of 760,000 gal (2.8 million L) and a working capacity of 600,000 gal (2.2 million L). The tanks are made of carbon steel plate with a thickness of at least 0.4375 inch (1.1 cm) for the sides, 0.656 inch (1.7 cm) for the floor and 0.4375 inch (1.1 cm) for the roof. Tanks 8D-1 and 8D-2 are fitted with an elaborate grid work of wide flange beams supported approximately 2 ft (61 cm) above the tank bottom by cross members of 1-inch (2.54-cm) thick steel plates. These plates are supported about 10 inches (25.4 cm) above the tank bottom by 1.5 inch-diameter (3.8-cm) staybolts welded to doubler plates on the tank floor and to the vertical supporting plates above. The tank roof is supported by 8-inch schedule (20.3 cm) pipe columns resting on top of this beam assembly at 45 locations throughout the tank. There are numerous tank roof penetrations for various functions such as a liquid-level probe assembly, a steam-heat exchanger (8D-2), a corrosion coupon rack (8D-1), a mixing pump, and waste transfer equipment. The stainless steel pans in each tank vault are equipped with liquid level indicators, monitors, and alarms. A transfer pump in each pan allows accumulated liquid, if any, to be transferred to the respective tank in the event of a release. Inspections of the tank farm and monitoring equipment are performed twice per day.

Upon completing the processing of SBW, HLW storage activities within these units were completed and tanks 8D-1 and 8D-2 (including the STS) were isolated in July 2003 by the separation and capping of piping and/or blanking of valves. Concurrent with the isolation of these units, grout was strategically injected into the soil around tank 8D-2 to limit the potential infiltration of groundwater into the tank containment vault. As of September 30, 2004, a heel of 14,192 gal (53,723 L) remains in tank 8D-1 and a heel of 5,281 gal (19,991 L) remains in tank 8D-2.

Tanks 8D-3 and 8D-4 are also below-ground in a common concrete vault. Tank 8D-4 was used to store acidic THOREX waste generated during a single reprocessing campaign of approximately 16,000 kg (16 metric tons) of thorium-enriched uranium fuel. This HLW was stored in an acid form in the stainless steel tank to prevent precipitation of the thorium. In January 1995, the waste in tank 8D-4 was transferred to tank 8D-2. Tank 8D-3 served as backup for the waste in tank 8D-4. Tank 8D-3 was also used as a holding and sampling tank for low-level liquid wastes that were processed through the STS.

Tanks 8D-3 and 8D-4 are similar in construction and instrumentation. The tanks, composed of 304 and 304L stainless steel, are 12 ft (3.66 m) in diameter and 16 ft (4.9 m) in height, with a working capacity of 13,410 gal (50, 762 L). Tank 8D-4 was used for storage of the THOREX waste. The majority of its contents have been transferred to tank 8D-2 to facilitate its treatment. Tank 8D-4 was utilized in the vitrification process for waste header collection. Tank 8D-3 was used as a process tank in the STS and to receive vessel vent condenser concentrates during the vitrification process. A sump is present in the bottom of the tank vault to accumulate free liquids, if any. A liquid-level probe monitors the level of liquids in the sump and a steam operated jet can transfer accumulated liquids to tank 8D-3, as necessary.

Tanks 8D-3 and 8D-4 continue to be used for storage and processing of radioactive and mixed wastewater. Tanks 8D-3 and 8D-4 currently store 9,698 gal (36,711 L) and 4,098 gal (15,513 L) of waste, respectively. Tank 8D-3 continues to be used to manage liquid plant decontamination waste, laboratory waste, and potential RHWF waste. Tank 8D-4 is currently being used to store liquid waste generated during the flushing of and dismantlement of the vitrification treatment unit.

SWMU #19: The STS was not part of the original fuel processing design but was installed to support the solidification of the solid HLW. The STS, which began radioactive operations in May 1988, is installed within and adjacent to tank 8D-1. The STS is operated as an interim status waste treatment unit. The STS is a zeolite ion-exchange system designed to strip Cs, Sr, and plutonium from the tank 8D-2 solutions. The STS equipment installed in tank 8D-1 includes a prefilter, a feed tank, a cooler, three zeolite ion-exchange columns (each having a capacity of 60 cubic feet (ft^3) of zeolite), and a sand filter. The equipment in the STS support building does not come in contact with the wastes; it provides water for processing flushing, and coolant, and allows for the addition of fresh zeolilte.

The STS vessels are largely contained within tank 8D-1. The STS process involves five steps:

- A vertical turbine pump in tank 8D-2 is used to decant the liquid to the prefilter and STS collection tank 50-D-001.
- The 8D-2 solutions are filtered to remove suspended fines (particles), water is added, and the solutions are cooled for optimum processing and increased Cs-137 removal. The prefilter and supernatant cooler are located within tank 8D-1.

- Following filtration and cooling, the liquid wastes are passed through ion-exchange columns containing zeolite. The majority of the cesium, plutonium, and strontium dissolved in solution are absorbed onto the ion-exchange. The ion-exchange columns are housed in tank 8D-1.
- Following ion-exchange, the decontaminated solutions are filtered to remove suspended zeolite fines and collected in the bottom of tank 8D-1 and/or collected in tank 8D-3. Following sampling, the decontaminated solution is transferred to the LWTS,
- The cesium loaded ion-exchange media (zeolite) is discharged from the columns to the bottom of tank 8D-1. Columns are discharged one at a time; following discharge, the ion-exchange column is regenerated with fresh zeolite.

The STS processed approximately 600,000 gal (2,271,000 L) of supernatant and more than 1,000,000 gal (3,785,000 L) of sludge-wash solutions. The sludge-wash solutions were similar in chemical composition to the untreated PUREX precipitates in tank 8D-2. The SBW was also treated through the STS prior to transfer to the LWTS.

As summarized for SWMU #13, the STS has been isolated by the separation and capping of piping and/or blanking of valves. Zeolite still remains in columns A, B, and C.

SWMU #20: The VF is located adjacent to the Process Building, where radioactive HLW was vitrified into borosilicate glass. The vitrification treatment unit was operated as an interim status waste treatment unit. The VF includes a CFMT, a melter feed hold tank (MFHT), a slurry-fed ceramic melter (Melter), a slurry sample station, a canister turntable, canister lid welding and decontamination stations, an off-gas process system including a submerged bed scrubber, high-efficiency mist eliminators and high-efficiency particulate air filters, process and backup cranes, a canister transfer cart, and associated interconnected piping and wiring.

The major functions of the VF were melter feed preparation, HLW vitrification, and canister filling, handling, and storage. The units that made up the VF were located in the Vitrification Cell (VC) that measures 34 ft (10.4 m) wide, 65 ft (19.8 m) long, and 42 ft (12.8 m) to the overhead crane hook. The pit floor slopes north to a channel that leads to a sump nearly centered on the north wall. This pit is lined with 1/8-inch-thick (0.3-cm) stainless steel plate to contain spills. The pit is 34 ft (10.4 m) wide, 25 ft (7.6 m) in a north-south direction, and 14 ft (4.3 m) deep. The pit area holds the vessels containing the radioactive slurry. All other vessels, which were above grade and on the apron, either contained few liquids or little radioactivity. The HLW lines enter below grade near the center of the west pit wall. On the north wall the sample table, associated viewing window, and manipulators are used to take samples from the CFMT. In the northeast corner another viewing window is centered on the top of the melter box. This provides viewing for manipulation of the Melter's top flanges. This window also provides a view of the apron of the VC. The canister welding and decontamination stations and the transfer cart can be observed from this window. The canister welding station and canister decontamination station are located along the east wall of the VC.

Associated with the VF are nine process tanks and one waste tank contained in the cold chemical system building. The cold chemical system was used for preparation and transfer of non-radioactive slurries, decontamination solutions, and water to the VF during integrated testing and radioactive operational phases of the vitrification campaign. The cold chemical building is located northwest of and adjacent to the VC. It is 57 ft by 34 ft (17.3m by 10.4 m), with a concrete foundation and concrete walls extending to an average height of 2 ft (0.6 m), above which the construction is steel frame and aluminum siding. The floor is coated with a chemical-resistant covering. Two of the 10 tanks contained nitric acid and sodium hydroxide used as additives to the HLW to be vitrified. Six of the tanks are holding tanks or mix tanks for various concentrations of the glass formers, waste stimulant (used for testing), nitric or caustic solutions, and miscellaneous decontamination solutions as required that were fed to the VC and Melter. One of the remaining tanks was used as a temporary (<90 days) waste storage tank. The remaining tank functioned as particulate scrub solution tank for off-gases from the other tanks within the cold chemical building.

In 2004, the WVDP began dismantlement of the vitrification treatment unit from within the VC. To date, the Melter, CFMT, and MFHT have been removed and packaged as LLW awaiting off-site disposal. In addition, the submerged bed scrubber, high-efficiency mist eliminators, and condenser unit have been moved into appropriate mixed waste storage areas. Smaller pieces of vitrification treatment unit equipment that has been removed have been stage in SWMU #46 (Section 5.22).

4.4.2 Wastes Managed at SSWMU #4

SWMU #s 13, 19, and 20 essentially managed identical wastes within their respective units since the treatment process for HLW was from the HLW Tank Farm through the STS and into the VF for final treatment by solidification. The hazardous waste codes, hazardous waste constituents, and underlying hazardous waste constituents identified in the HLW are presented Table 4-8.

Spills: Historical liquid-level data from the tank vaults maintained in the WVDP Operations Record indicate that the tanks of the HLW Tank Farm have not leaked during their operational history. Tank vaults are monitored with liquid-level indicators that are read and recorded twice a day. Prior to 1989, there was one documented release associated with operations of the tank farm. In 1985, a leaking flange valve led to the release of approximately 500 gal (1,900 L) of condensate that was being transferred to tank 8D-2. Migration of the release material was mitigated and impacted soil was excavated and placed in containers. Since 1989, all spills and releases at the WVDP are tracked with a database. Based on database records, any spills or releases in the vicinity of the tank farm were immediately containerized and cleaned up. Any potentially contaminated soils were excavated and properly disposed. Routine inspections of the STS have not identified any spills or releases within this unit. In addition, routine inspections of the VF have not identified any spills or releases that have been released to the environment (any release has been contained by the stainless steel liner).

4.4.3 Environmental Characterization

4.4.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: From 1991 to 1994, groundwater from the sand and gravel unit in the vicinity of SSWMU #4 was routinely sampled for TCL VOCs and SVOCs, pesticides, and PCBs, and TAL metals. Eight monitoring wells were sampled during this period to assess groundwater conditions associated with SSWMU #4.

Stream/Ditch Sediment Sampling: One stream/ditch sediment sample was collected downslope of SSWMU #4 for analysis of TAL metals and TCL SVOCs.

Surface Soil Sampling Program: In July 1990, two surface soil samples were collected near the HLW Tank Farm at depths of 0-6 inches (0 to 15 cm) and at 6-18 inches (15 to 46 cm) as part of a sampling program at waste management areas. These samples were analyzed for indicator parameters and TCL VOCs.

Deep Soil Sampling Program: Samples from two downgradient boreholes were collected at two discrete intervals in each borehole to characterize SSWMU #4 deep soils. Samples were analyzed for TCL VOCs and SVOCs, TAL metals, and radiological parameters.

The results of these investigations are summarized in Table 4-9.

4.4.3.2 Post-RFI Environmental Monitoring

Post-RFI monitoring at the High-Level Waste Storage and Processing Area has consisted of groundwater monitoring for VOCs and radiological parameters at monitoring wells 406, 408, 8607, and 8609. Table 4-10 presents positive detections of VOCs in groundwater samples collected since the RFI for SSWMU #4, in accordance with the Agency-approved RFI recommended sampling. These data are current through June 2004. These results are compared to NYSDEC's TOGS 1.1.1 groundwater quality standards.

Observed historical and current groundwater conditions are as follows:

Volatile Organic Compounds: Detectable levels of VOCs have only been reported on two occasions at well 8609. However, these concentrations have been reported below TOGS 1.1.1 groundwater quality standards.

Radiological Parameters: Concentrations in groundwater of the radiological indicator parameter gross alpha at monitoring wells 406 and 8607 have remained stable over the last 12 years (Figure 4-7). There has been a slight increase in the trend for the gross beta concentration at well 8607. The tritium concentration at monitoring well 406 is steadily decreasing and for well 8607 has remained stable. These data trends provide support to the conclusions above from the non-radiological data that there have been no adverse impacts on the groundwater quality downgradient of SSWMU #4.

4.4.4 Conclusions and Recommendations

The results of the RFI did not indicate the presence of a release of RCRA-regulated hazardous constituents or waste from SSWMU #4. The RFI report concluded that no further action was necessary for the High-Level Waste Storage and Processing Area, except for continued groundwater monitoring at wells 406, 408, 8607, and 8609. NYSDEC and EPA accepted the conclusions and recommendations of the RFI Report in their February 11, 1997 correspondence (Appendix A) and added "…the report's conclusions and recommendations for the long-term monitoring and closure necessary for this unit:

1. Continued groundwater monitoring at downgradient wells 406, 408, 8607, and 8609 for the following parameters:

   a. Radiological indicator parameters on a semi-annual basis.
   b. Appendix 33 VOCs on an annual basis.

2. Perform RCRA closure of the tank system and ancillary equipment pursuant to 6 NYCRR Subpart 373-3 Interim Status Standards.

3. Additional rounds of groundwater sampling and analysis have been performed for RCRA metals. Based on this data, submit a supplemental statistical evaluation to support conclusions and recommendations."

These activities have been implemented and continue as discussed in the previous section. The recommended post-RFI groundwater monitoring data continue to support the conclusion of the RFI that there has not been a release of RCRA-regulated hazardous constituents to the environment from SSWMU #4.

The Vitrification Facility (SWMU #20) has been an active interim status hazardous waste management unit and the continued operation has been handled according to RCRA operating requirements. Additionally, this unit is subject to RCRA closure under interim status or final status standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #20.

A decommissioning Environmental Impact Statement (EIS) is being prepared to address the closure of the HLW Tank Farm (SWMU #13) and the STS (SWMU #19). It is anticipated that upon approval of the final Decommissioning EIS, RCRA Corrective Action requirements will be addressed.

4.5 SSWMU #5 Maintenance Shop Leach Field

SSWMU #5, identified as the Maintenance Shop Leach Field (MSLF), was constructed by NFS to treat the sanitary waste discharge from the Test and Storage Building, the Maintenance Shop and, for a short time, Trailer P. Figure 1-1 shows these buildings and the component units of the MSLF. The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 9, Maintenance Shop Leach Field* (WVDP-RFI-025) (WVNSCO, July 1997).

4.5.1 Description and Operational History

The MSLF is located northeast of the Process Plant on the north side of the Maintenance Shop and the Test and Storage Building on the North Plateau. Three septic tanks, a distribution box, a tile leach field and associated piping comprise this SWMU. Records indicate the leach field covered an area of 1,500 square feet (ft^2) The MSLF was taken out of service in 1988 and has remained inactive ever since.

The components of the MSLF were constructed in stages between 1968 and 1972 to manage sanitary waste generated in the Test and Storage Building and the Maintenance Shop. In 1968, the first septic tank, the distribution box, the leach field and the associated piping were installed to manage waste from the Test and Storage Building. In 1970, the Maintenance Shop was built and a second septic tank was installed and connected to the existing system. A third septic tank was installed and tied into the existing system in 1972, but reportedly was never used. In 1986, effluent from Trailer P was routed to the septic tanks. In 1988, after taking the MSLF out of service, the line leading to the leach field was plugged and one septic tank was filled with sand. In 1997, the remaining two tanks were backfilled in accordance with a plan approved by the NYSDEC.

4.5.2 Wastes Managed at SSWMU #5

The Test and Storage Building discharged effluent from a toilet, urinal and floor drain to septic tank #1. The Maintenance Shop discharged effluent generated in five sinks, two toilets, a urinal, a drinking fountain, one shower and the shower room floor drain to septic tank #2. Septic tank #3 was installed to accommodate planned expansion of the sanitary facilities, but the expansion never took place. A sink in Trailer P was connected to the septic system in 1986.

Operations in these buildings may have used some or all of the following materials:

- cutting, lubricating and penetrating oils
- pipe dope, lapping compounds, gasket–forming compounds, and greases
- soldering and brazing fluxes, putties
- degreasing and cleaning compounds, paints and thinners, coatings
- small amounts of metal cuttings and grindings, and
- disinfectant and sanitizing agents.

There were no floor drains in the work area of the buildings; therefore, any spilled materials would not have been routed to the MSLF.

A preliminary analysis of the sediment in septic tank #1 for TCL VOCs, TAL metals, and radiological parameters detected the presence of VOCs, SVOCs, TAL metals and radiological parameters at concentrations sufficiently low such that they did not exceed the TCLP limits.

The water in septic tank #3 was analyzed for the same analytes as septic tank #1 and VOCs, SVOCs and TAL metals were detected. However, the contents were not classified as RCRA characteristic waste since none of the detections exceeded TCLP limits specified in 6 NYCRR §371.3(e).

Spills: There have been no uncontained spills or releases to the environment as a result of operations at the MSLF and all quantities spilled were below regulatory reportable quantities. The spills that did occur inside the facilities were contained and cleaned up. Spills occurring outside the facilities were cleaned up to applicable standards. The residuals and cleanup materials associated with all the spills were collected and dispositioned appropriately.

4.5.3 Environmental Characterization

4.5.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: In 1991 routine groundwater sampling commenced with the analysis for contamination indicator parameters at wells in the vicinity of the MSLF. In 1993-94 additional groundwater sampling was performed at seven wells (104, 116, 408, 501, 502, 602, and 8604), for analysis of TCL VOCs, SVOCs, pesticides and PCBs, TAL metals, and radiological indicator parameters.

Near Surface Soil Sampling Program: In 1990 two composite soil samples were taken near the MSLF; one from 0 to 6 inches and one from 6 to 18 inches below grade. They were analyzed for total organic carbon (TOC), total organic halogen (TOX), total Kjeldahl nitrogen, phenols and TCL VOCs.

Shallow Soil Sampling Program: Associated with the deep soil sampling program. Five samples (0–2 ft) collected for analysis of TAL metals.

Deep Soil Sampling Program: Five deep boreholes were drilled at the MSLF as part of the RFI; two upgradient and three downgradient (BH-32, BH-34, BH-35, BH-36, and BH-37). These samples were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL metals, and radiological indicator parameters.

A summary of the results can be found on Table 4-11.

4.5.3.2 Post-RFI Environmental Monitoring

In accordance with the approved RFI Report, monitoring wells 501 and 502 were selected to monitor the MSLF for VOCs. Groundwater monitoring results indicate no VOCs have been detected above regulatory standards (Table 4-12), including no detectable concentrations at well 502. On the recommendation of the NYSDEC after review of the RFI Report, septic tanks #1 and #3 were emptied, cleaned and backfilled with sand. Septic tank #2 had previously been backfilled with sand. Therefore, the potential for future release has been removed.

4.5.4 Conclusions and Recommendations

Based on groundwater monitoring data collected since 1991; the fact that the unit was taken out of service; and the implementation of NYSDEC recommendations to the RFI Report conclusions (June 16, 1997, Appendix A) no further action is recommended for this SWMU. In addition, post-RFI groundwater monitoring results indicate there have been no detectable releases of RCRA hazardous constituents from the MSLF. Therefore, RCRA Corrective Action should be considered complete for SWMU #8.

4.6 SSWMU #6 Low-Level Waste Storage Area

SSWMU #6, identified as the Low-Level Waste Storage Area (LLWSA), is located on the WVDP as shown in Figure 1-1. This unit consists of the Old and New Hardstands, the LAG Storage Building, Drum Super Compactor (SWMU #38), and the LAG Storage Additions (LSAs) #1, 2 Hardstand, 3, and 4. The structure at LSA #2 Hardstand has been disassembled; however, the gravel base pad (i.e., hardstand) is still in place. The LLWSA facilities provide weather protection for packaged low-level radioactive, TRU, and mixed radioactive wastes. The LLWSA is situated about 400 ft (120 m) northeast of the Process Building. The six SWMUs which collectively comprise SSWMU #6 include:

- SWMU #9 - Old Hardstand,
- SWMU #9A - New Hardstand,
- SWMU #15 - LSAs #1 and 2 Hardstand,
- SWMU #16/16A - LAG Storage Building (LSB) and LSAs #3 and 4, and
- SWMU #38 - Drum Super Compactor.

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 6, Low-Level Waste Storage Area* (WVDP-RFI-022) (WVNSCO, October 1996).

4.6.1 Description and Operational History

SWMU #9: The Old Hardstand was a paved asphalt pad measuring about 150 ft by 150 ft (46 m by 46 m) located approximately 500 ft (150 m) north of the Process Building. It was slightly elevated above the surrounding ground surface and drainage ditches existed around its perimeter.

The Old Hardstand was part of the original NFS site construction. It was used to store radioactive equipment that was either too large or cumbersome to be packaged in standard containers or that was designated for reuse. Historical aerial photographs indicate the presence of material on the hardstand such as drums, boxes, and other equipment. Detailed information on the quantity of wastes stored on the old hardstand is not known. A 1984 aerial photograph shows the old hardstand to be clear of all material with some vegetation growing through its surface.

The Old Hardstand was taken out of service in 1984. The asphalt and some of the soil was removed and used as fill during the decommissioning of Lagoon 1. Before the excavation and removal of material from the Old Hardstand, soil and vegetation samples were collected from the area and analyzed for radiological parameters. Beta and gamma-emitting nuclides were reported as responsible for the majority of activity measured in and around the old hardstand. During its 1984 excavation, 45,909 ft^3 (1,300 m^3) of material was placed in Lagoon 1.

SWMU #9A: In 1986, the New Hardstand was built in the same general area as the old hardstand. The New Hardstand is a compacted gravel pad originally used to store packaged radioactive steel, concrete rubble, and miscellaneous LLW. The New Hardstand currently stores low-level, non-liquid radioactive wastes. Inventories are maintained of wastes currently stored at the new hardstand and other facilities comprising SSWMU #6.

SWMU #15: LSAs #1 and #2 Hardstand were built in 1987 and 1988, respectively. LSA #1 is a pre-engineered metal frame and fabric enclosure on a compacted gravel pad. The fabric of LSA #1 is vinyl-coated polyester that is flame resistant, self-extinguishing and is designed to support snow loads of up to 30 lbs/ft^2, and wind velocities of 100 miles per hour. LSA #1 has a 14-ft high by 12-ft wide metal roll-up door and 10 air dampers located at the top of the structure. LSA #1 and LSA #2 Hardstand are identified as RCRA interim status container storage units on the RCRA Part A Permit application. The calculated capacity of LSA #1 is 302,961 gal or 1,948 metric tons. The containerized wastes stored at LSA #1 have included LLW and LSA-1 has not been used to store mixed wastes.

The LSA #2 structure was disassembled and removed from service in 1993 due to tears in its fabric cover and concerns for the structural integrity of the metal frame. The gravel pad was left in place and is currently used as a hardstand to store low-level, nonliquid radioactive waste and shielded mixed waste removed from the VC.

SWMU #16: The LSB, which was constructed in 1984, is located about 400 ft (120 m) northeast of the Process Building. It is a pre-engineered insulated metal, Butler-style structure supported by a clear span frame anchored to a 140 ft by 60 ft (43 m by 18 m) concrete slab. The concrete slab is 20 inches (50 cm) thick at its center and gradually slopes downward to a thickness of 8 inches (20 cm) at the outside edges. A 6-inch-high (15-cm) high concrete curb that can contain spills and leaks encloses the perimeter. The eave height of the building 15.7 ft (4.8 m) and the height to the center ridge of the sloped roof is 17 ft (5.2 m). The LSB is identified as RCRA interim status container storage unit on the RCRA Part A Permit application.

The LSB is used to store containerized LLW, mixed waste LLW, TRU, and mixed TRU waste generated from routine WVDP operations. The LSB also contains PCB-contaminated solids. The listed capacity of the LSB is 350,088 gallons or 2,251 metric tons. Waste boxes are stored in stacks to a maximum of four high and drums are stored on steel pallets to a maximum of four high.

SWMU #16a: LSAs #3 and #4 are used to store containerized LLW and mixed waste exclusive of PCBs. Construction of LSAs #3 and #4 was completed in early 1992. LSA #3 and LSA #4 are identified as RCRA interim status container storage units on the RCRA Part A Permit application. LSAs #3 and #4 occupy a limited portion of the Old and New Hardstands. During excavations for the foundations of these structures, some low levels of radioactively contaminated soil were encountered along the northeastern margin of the Old Hardstand. This is most likely attributable to Old Hardstand activities. All soils above background radiological levels generated during the construction of LSAs #3 and #4 were placed in storage containers and taken to on-site storage facilities.

LSA #3 and LSA #4 were originally pre-engineered aluminum and fabric enclosures erected above a concrete pad. Recent modifications include replacement with full metal structures, a covered passageway connecting the two storage areas, and a Shipping Depot adjacent to LSA #4. Each structure is about 88 ft wide by 291 ft long by 40 ft high (26 m by 88 m by 12 m). The poured concrete floors of the two buildings are surrounded by a 6-inch-high perimeter curb that acts as secondary containment. Both structures are provided with electrical service. The storage capacity of LSA #3 is 1,203,765 gal or 7,742 metric tons. The storage capacity of LSA #4 is 1,238,774 gal or 7,966 metric tons. LSA #4 includes an enclosed area for container sorting and repackaging (Container Sorting and Packaging Facility).

SWMU #38: The Drum Super Compactor is discussed separately in Section 5.14.

4.6.2 Wastes Managed at SSWMU #6

SWMU #15

As previously stated, LSA #1 has been used to store LLW and has not been used to store any mixed waste. LSA #2 Hardstand has been recently used (i.e., 2004) to store mixed LLW generated during the vitrification treatment unit dismantlement activities. Otherwise, LSA #2 Hardstand has been used to manage LLW.

SWMU #16/16a

The LSB and LSAs #3 and 4 have been used to manage LLW, mixed LLW, and TRU wastes.

During excavation of the footings for LSAs #3 and #4 in 1990, 32 soil samples were collected and analyzed for total metals and EP Toxicity metals. The footing holes were excavated to a depth of 4 ft (1.2 m) with the samples being collected from the bottom of the holes. All metals results were within concentration ranges typical of native soils.

Spills: There have been several spills in the LLWSA; none of which were of a character or quantity which required immediate regulatory reporting as tracked in the WVDP's spill database as previously discussed in Section 4.1.2. All spills were addressed in a timely manner and properly dispositioned according to requirements.

4.6.3 Environmental Characterization

4.6.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: From 1991 to the RFI, monitoring wells (i.e., 406, 601, 602, and 604) in the vicinity of SSWMU #6 were sampled biannually for groundwater quality parameters. During the RFI, these wells and wells 603, 605, and 8607 were sampled as part of the expanded characterization for TCL VOCs, SVOCs, pesticides, and PCBs, TAL metals.

Stream Sediment: Sediment samples were collected from two stream/ditch locations (i.e., ST-37 and ST-38) near the LLWSA and one background location. These samples were analyzed for TCL SVOCs and TAL metals, and additionally at one location, for TCL VOCs.

Near Surface Soil Sampling Program: On June 16, 1994, one surface soil sample was collected from the area of the former LSA #2 Hardstand structure following its disassembly. The sampling location was identified by radiological field screening and by historical knowledge. The sample was analyzed for TCL VOCs, SVOCs, and TAL metals. Additionally, 3 shallow soil samples (0 – 2 ft; 0 – 0.6 m) from soil boring locations BH-25, BH-29, and BH-30 were collected for analysis of TAL metals.

Deep Soil Sampling: Samples from three boreholes (i.e., BH-25, BH-29, and BH-30) were collected to characterize LLWSA deep soils. Four subsurface soil samples were analyzed for TCL VOCs, SVOCs, and TAL metals.

The analytical results are summarized in Table 4-13.

4.6.3.2 Post-RFI Environmental Monitoring

The results of the RFI did not identify the presence of a release of RCRA hazardous constituents. As a result, it was recommended that no further action under the Consent Order was necessary; except for continued groundwater monitoring as specified in the RFI report. This report includes a summary of post-RFI radiological indicator parameter data (Figure 4-8) for monitoring wells 602, 604, and 605 in the vicinity of the LLWSA. These data show stable or decreasing trends for all three indicator parameters.

4.6.4 Conclusions and Recommendations

Based on the results of the RFI, the final report concluded that no further action under the Consent Order was necessary. The conclusions and recommendations of the RFI for the LLWSA were approved in a joint NYSDEC/EPA correspondence dated July 30, 1996 (Appendix A). The Agencies letter further stated that "…continued groundwater monitoring required by the RCRA Groundwater Monitoring Plan, in conjunction with the continued management and inspections of storage areas is sufficient. No further action is necessary." Management and inspections of the storage areas and groundwater monitoring per WVDP-239, *Groundwater Monitoring Plan,* continues to be implemented.

The LSAs #1 and #2 Hardstand (SWMU #15), LAG Storage Building (SWMU #16), and LSAs #3 and #4 (SWMU #16A) are active interim status hazardous waste management units and the continued operation will be managed according to RCRA requirements. Additionally, these units are subject to RCRA closure under interim status or final status standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting

RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMUs #15, 16, and 16A. In addition, given the results of the RFI and subsequent monitoring data, and the anticipated clean closure of the above-referenced SWMUs, RCRA Corrective action should also be considered complete for SWMU #9/9A.

4.7 SSWMU #7 Chemical Process Cell – Waste Storage Area

SSWMU #7, identified as the Chemical Process Cell-Waste Storage Area (CPC-WSA), was originally constructed in 1985 as a tent-like structure. In 1998, the original facility was replaced with a more robust steel structure. The CPC-WSA (SWMU #14), a temporary storage area for radioactively contaminated equipment and waste removed from the Process Building, is located 900 ft (274 m) northwest of the Process Building at the northwest corner of the WVDP (Figure 1-1).

The information presented in the following subsection have been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 7, Chemical Process Cell - Waste Storage Area* (WVDP-RFI-023) (WVNSCO, December 1996).

4.7.1 Description and Operational History

The CPC-WSA is an arched, 12-gauge galvanized-steel panel structure approximately 200 ft (61 m) long by 70 ft (21 m) wide by 30 ft (9 m) high, on a packed gravel pad. The pad does not have an engineered drainage system; however, it is sloped so that precipitation drains away from the storage area. The current structure was erected in 1998 to replace the original fabric-covered spring-steel frame structure erected in 1985. The replacement structure overlies the entire footprint of the original structure.

The CPC-WSA was built as a temporary storage area in an area that had not been previously used for disposal or storage activities by either NFS or DOE for radioactively contaminated equipment removed from the CPC. This stainless steel and carbon steel equipment is contaminated with residues of radioactive waste and is being stored in the CPC-WSA until disposition of the waste has been determined. These materials are stored in carbon steel storage boxes and are surrounded by hexagonal concrete shield containers to limit the dose to WVDP personnel.

The waste in the containers is scheduled to be processed through the RHWF where it will be classified, re-packaged and prepared for disposal. The RHWF waste processing activities began in the summer of 2004.

4.7.2 Wastes Managed at SSWMU #7

The wastes managed in the CPC-WSA were primarily derived from the decontamination and decommissioning (D&D) of the CPC. The wastes managed include LLW and mixed LLW waste.

4.7.3 Environmental Characterization

4.7.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: In 1991 routine groundwater sampling commenced with the analysis for contamination indicator parameters at wells in the vicinity of the CPC-WSA. In 1993-94, additional groundwater sampling was performed as part of the site-wide RFI for analysis of TCL VOCs, SVOCs, pesticides, and PCBs, TAL metals, and radiological indicator parameters at wells 702, 703, 704, 705, 706, and 707.

Stream Sediment Sampling: Two stream sediment samples (ST-4 and ST-5) were collected from Quarry Creek downstream of the CPC-WSA during the RFI. ST-4 was analyzed for TCL VOCs and TAL metals, and ST-5 was analyzed for TAL metals.

Shallow Soil Sampling Program: In 1993 shallow (0-6 inches) soil samples were taken at the WVDP as part of the RFI. One sample, SS-1, was taken at the CPC-WSA and analyzed for TCL SVOCs and TAL metals.
Deep Soil Sampling Program: One deep boring (BH-43) was completed downgradient from the CPC-WSA during the RFI. Two samples taken from this boring were analyzed for TCL VOCs and TAL metals.

A summary of the RFI sampling program is included in Table 4-14.

4.7.3.2 Post-RFI Environmental Monitoring

Post-RFI groundwater monitoring for SSWMU #7 included analysis of radiological indicator parameters at wells 704, 706, and 707. Historical trends for these parameters indicate that the gross alpha and tritium trends have remained stable (Figure 4-9). The gross beta trend has shown a very slight increase in post-RFI levels, although this change is approximately 5 pCi/L. These data indicate no release to groundwater of RCRA hazardous constituents.

Spills: There have been no uncontained spills or releases to the environment as a result of operations at the CPC-WSA. The waste containers in the CPC-WSA are inspected weekly to verify their integrity and the structure and support system are inspected quarterly. Spills occurring outside the facilities from equipment and site operations were cleaned up to applicable standards. The residuals and cleanup materials associated with all the spills were collected and dispositioned appropriately.

4.7.4 Conclusions and Recommendations

Based on the results of the RFI, the final report recommended no further action for the CPC-WSA under the Consent Order. NYSDEC and EPA concurred with the conclusions and recommendations in the report and added that the only further actions necessary were continued groundwater monitoring required by the WVDP Groundwater Monitoring Plan and continued management and inspection of the storage areas (November 22, 1996, Appendix A). The CPC-WSA is an active interim status hazardous waste management unit and the continued operation will be handled according to RCRA operating requirements. Additionally, the CPC-WSA is subject to RCRA closure under interim status or final status standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #14.

4.8 SSWMU #8 Construction and Demolition Debris Landfill

SSWMU #1, the CDDL, received non-radioactive construction, office, and facility debris, and incinerator ash from the burning of paper and cardboard wastes from 1965 through initiation of landfill closure activities in December 1984. The information presented in the following subsections has been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 3, Construction and Demolition Debris Landfill* (WVDP-RFI-019) (WVNSCO, April 1996).

4.8.1 Description and Operational History

The CDDL is located northeast of the Process Building. It is approximately 1.5 acres (0.6 ha) in area and approximately 10 ft (3 m) in depth. Wastes were typically placed on pre-existing grade, although some areas of the CDDL were excavated to a depth of 6 ft (1.8 m) prior to disposal activities.

The CDDL has four distinct time frames that correspond with facility operations. These periods include: the time during facility construction (1963-1965), the time during facility operation (1965-1982), the time during operation of the WVDP before the unit's closure (1982-1986), and the time after closure (1986-present). Each of these time periods is summarized below.

The CDDL area was initially used in 1963 by the construction contractor (Bechtel Engineering) to dispose of waste materials generated during construction of the nuclear reprocessing facility. A review of aerial photographs indicates that construction debris was placed directly on the ground surface without excavation.

After initial construction of facilities associated with the WNYNSC, NFS continued to use the CDDL for debris material disposal from 1965 to 1981. According to historical information and employees with historic knowledge, materials disposed in the CDDL during that time frame included nonradiological construction waste and office-generated solid waste. Disposal records showing the exact composition and quantity of wastes were not maintained.

NFS's operation of the CDDL began in the western corner of the area and progressively moved east. According to at least one report referenced in WVDP-RFI-019 less than 0.5 acres (0.2 ha) was used for disposal during NFS operations. Site personnel stated that the disposed material was compacted incidentally during dirt-moving activities by heavy equipment and covered with soil on a periodic basis. A review of aerial photographs indicates that while disposal operation were taking place in the western corner, what appears to be soil borrowing activities were occurring in the eastern corner as early as 1978. The sand and gravel removed from this area was reportedly used in site construction projects and as daily cover at the CDDL.

In 1972, NFS obtained a permit to operate a waste paper incinerator for combustion of nonradioactive solid waste generated from office and facility operations. The resulting incinerator ash was disposed of in the CDDL. The use of the incinerator reduced the quantity of solid waste, particularly paper and cardboard wastes, disposed in the CDDL.

The WVDP assumed control of the site in 1982 and disposal operations at the CDDL remained consistent with previous practices. A review of historical maps and aerial photographs indicates that the WVDP placed waste on an additional acre of the CDDL. The WVDP performed extensive cleanup activities at the WVDP between 1982 and 1985. Most of the waste disposed in the CDDL until 1984 probably was excess equipment and scrap removed from noncontaminated areas in and around the facility. In addition, solid paper and cardboard wastes generated in the facility and office continued to be incinerated until 1984 and the resulting ash was disposed in the CDDL. In 1984, the incinerator was taken out of service.

Historical information, aerial photographs, and discussions with long-time employees indicate that waste was placed in 3- to 5-ft (1- to 2-m) lifts, covered with soil, and compacted by heavy equipment such as bulldozers and trucks. During the early 1970s, NFS constructed a 600-ft (183-m) long drainage ditch directly to the north of the CDDL. The ditch had a maximum width of 30 ft (9 m) at the west end of the CDDL and narrowed to about 10 ft (3 m) to the east of the CDDL. The ditch had an estimated maximum depth of 8 ft (2.4 m). This drainage ditch diverted surface water and groundwater drainage to one of two surface water monitoring stations.

The two surface water discharge points, WNSW74A and WNSWAMP, are located northwest and northeast of the CDDL. WNSW74A, located northwest of the CDDL, does not receive surface water from the CDDL. Sampling location WNSWAMP is located northeast of the CDDL at the end of the drainage ditch located on the north side of the CDDL. Surface water discharging from WNSWAMP includes surface water and groundwater contributions from the CDDL, parts of the LAG storage areas, and groundwater seeps from the North Plateau Sr-90 plume. This surface water discharge point has been sampled since 1972 for gross alpha, gross beta, and tritium. During NFS operations WNSWAMP was known as the northeast ditch sampling location.

In December 1984, the WVDP discontinued burial of wastes in the CDDL and prepared for closure in accordance with appropriate state and federal standards. An engineered closure plan was submitted to NYSDEC for review and approval. NYSDEC subsequently performed a closure inspection of the disposal unit on July 23, 1985. During this inspection, the presence of leachate outbreaks on the north and east slopes were noted. Following the August 14, 1995 inspection, ditch water samples and a soil sample from the leachate outbreak on the east slope of the CDDL were collected and analyzed for EP Toxicity metals and TOX. The analytical results did not exceed EP Toxicity regulatory levels and the TOX results were similar at all three locations. A supplemental closure plan was developed and implemented to correct the leachate outbreaks.

Closure specifications for the unit performed in accordance with 6 NYCRR §360-7.6, which required that: 1) the final cover over this facility consist of a minimum of 18 inches (46 cm) of compacted soil and 6 inches (15 cm) of topsoil suitable to sustain plant growth; 2) the grass or ground cover crop be established and maintained on all exposed final cover material within four months after placement or, season not permitting, as otherwise prescribed by NYSDEC; and 3) the entire cover be graded at a minimum slope of 2%. The landfill closure activities were approved by NYSDEC in their correspondence dated October 28, 1986 (Appendix A).

A procedure for performing inspections and maintenance activities has been developed in standard operating procedure (SOP) 40-04. The SOP requires documentation of the inspections and any mitigative measures. Documentation data sheets require that observations be noted for such things as ponding, leaching, and erosion. Inspections are specified for the spring and fall when the water table is usually elevated. During high water table periods, groundwater may come in contact with limited portions of waste in the CDDL. Potential outbreaks would be most likely to occur during high water table conditions along the north or east sides of the unit. However, a potential "leachate" outbreak could occur anywhere around the unit. Therefore, the entire periphery is inspected. SOP 40-04 was also updated to include sampling and analysis of leachate outbreaks. If adequate volume is present, a grab sample of the liquid is collected and analyzed.

4.8.2 Wastes Managed at SSWMU #8

Records of disposal activities at the CDDL do not exist. At the time of disposal, the waste was characterized as nonradioactive, inert construction and demolition debris and solid wastes; therefore, chemical characterization was not performed. Since specific records were not available, other pertinent information was gathered and reviewed to establish a profile of waste materials in the CDDL. These included employee interviews, review of existing photographs, and review of correspondence. In addition to the above, pertinent literature regarding common wastes typically found at construction sites was consulted in an attempt to provide a waste profile.

The materials reportedly placed in the CDDL have been grouped into the following 10 different waste streams as described below:

Solid Office and Facility Waste: Based on operating time frames, this waste stream was likely disposed in the CDDL from 1965 to 1972, when the incinerator was brought on line. This waste stream is composed of office and employee waste and includes paper, plastic, cardboard, packaging materials, steel cans, bottles, and employee lunch scraps. The total quantity disposed in the CDDL is estimated to be approximately 6,500 cubic yards (yd^3) (5,000 cubic meters [m^3]) based on known generation rates in 1984.

Incinerator Ash: Incinerator ash from the incineration of paper, cardboard, packaging materials, and general office waste was generated between 1972 and 1984. Approximately 8 yd^3 (6 m^3) of ash is estimated to have been generated over 12 years. In April 1991, the ash remaining in the incinerator was sampled and analyzed by the WDVP. The results indicated that the ash was nonhazardous for RCRA metals.

Vehicles and Appliances: There are four reported occurrences of vehicles and appliances being disposed in the CDDL. These consist of a truck, a refrigerator, a van, and a forklift. The total volume attributed to this waste stream is calculated as 60 yd^3 (46 m^3).

Paint Cans: Paint cans were reportedly disposed in the CDDL between 1963 and 1984. The quantity of paint residues in the containers, however, is thought to be low due to standard practices of using up the paint and continuous painting activities over the life of the facility.

Wooden Pallets: Approximately 1,000 wooden pallets were disposed of in the CDDL.
Miscellaneous Steel Debris: Miscellaneous steel debris was generated throughout the life of the site, but most particularly during site cleanup activities between 1972 and February 1985. This debris consists of materials such as scaffolding, rebar, piping, tools, excess nonradioactive-contaminated equipment, and miscellaneous scrap steel. In 1980, one of the site boilers was rebuilt and scrap steel, refractory brick, and insulation material generated during this activity was reportedly disposed in the CDDL.

Tires: Approximately 100 tires were reportedly disposed in the CDDL.

Construction Debris: This waste stream consists of electrical wiring, wood, scrap wire, piping, concrete, light fixtures wall board, and ceiling tiles. The majority of this waste stream was generated during initial site construction and during site cleanup activities.

Maintenance Shop Waste: During NFS operations, maintenance shop wastes reportedly were disposed in the CDDL. Exceptions to this include waste oils and solvent residuals, which were reportedly used as dust suppressant on roadways (SWMU #41, Section 5.16). Wastes typically generated by a maintenance shop include floor sweepings, oil filters, fuel filters, brake pads, antifreeze, brake fluids, transmission fluids, welding slag, refrigerant, and batteries.

Boiler Scale: Boiler scale was routinely collected and removed annually during the system maintenance. This material is considered to be high in calcium and magnesium salts that are naturally present in area waters. A total of approximately 6 yd^3 (4.2 m^3) were generated over a 20-year period.

The CDDL contains an approximate total volume of 15,700 yd^3 (12,000 m^3) of waste material and soil, based upon historical survey information and the areal extent of material placement. Approximately 10,860 yd^3 (8,300 m^3) of waste are estimated to be present.

4.8.3 Environmental Characterization

4.8.3.1 Pre-RFI and RFI Environmental Monitoring

Leachate Outbreak Samples: On August 14, 1985, three samples were collected at the CDDL to investigate leachate outbreaks. Two water samples were collected; one upstream and one downstream ditch location along the north side of the CDDL. A soil sample was collected at the leachate outbreak on the east slope. These samples were analyzed for EP Toxicity metals and a TOX scan.

On March 26, 1990, a sample was collected from a leachate outbreak identified during routine inspections on the north side of the CDDL and analyzed for TOC, phenols, VOCs, TOX, bromide, fluoride, chloride, nitrate, total metals, and cyanide.

Groundwater Sampling Program: Since 1991, quarterly groundwater sampling has been performed in the vicinity of the CDDL from the sand and gravel unit for groundwater quality parameters. In 1993 and 1994, two rounds of groundwater sampling were performed to support RFI activities. Groundwater samples collected from wells 801, 802, 803, 804, 8603, and 8612 during the RFI activities were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, TAL metals, and radiological indicator parameters.

Surface Water Sampling: Surface water quality has historically been monitored at two downgradient locations (WNSWAMP and WNDMPNE) from the CDDL area. These have been sampled monthly since January 1991 for radiological indicator parameters.

Historical surface water sampling in the vicinity of the CDDL included a 1982 program to characterize site-wide water quality in support of a Safety Analysis Report. Inorganic and radiological analyses were performed at 14 surface water locations, one of which (NP-3) very nearly coincided with the current WNSWAMP sampling point.

To support RFI activities, downgradient surface water sampling location WMDMPNE was sampled during 1993 and 1994 for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals.

Surface Soil Sampling Program: In July 1990, two surface soil samples were collected from the 0- to 6-inch (0- to 15-cm) and 6- to 24-inch (15- to 61-cm) depths from the landfill cap material and analyzed for TCL VOCs, SVOCs, pesticides, and PCBs.

During the RFI, near surface soil sampling was performed at four sampling locations (BH-25, -26, -27, and -28) associated with SSWMU #8 to evaluate the effect of landfill operations. Soil samples were collected from depths of 0-2 ft (0-0.6 m) or 2-4 ft (0.6-1.2 m) and analyzed for TAL metals.

Deep Soil Sampling Program: During the RFI, subsurface soil sampling was performed at four sampling locations (BH-25, -26, -27, and -28) associated with SSWMU #8 to evaluate the effect of landfill operations. A total of seven soil samples were collected at depths ranging from 6-8 ft (1.8-2.4 m) to 16-18 ft (4.9-5.5 m) and analyzed for TCL VOCs and SVOCs, TAL metals, and radiological indicator parameters.

Stream/Ditch Sediment: Four stream sediment locations (ST-29, ST-30, ST-31, and ST-38) near the CDDL were used to assess whether releases from this unit have occurred (Figure 3-2). Sample locations ST-29 and ST-31 were analyzed for TAL metals and radiological indicator parameters. Sample locations ST-30 and ST-38 were sampled for TCL VOCs and SVOCs, TAL metals, and radiological indicator parameters.

Table 4-15 presents a summary of the pre-RFI and RFI sampling activities and analytical results.

4.8.3.2 Post-RFI Environmental Monitoring

Post-RFI monitoring at the CDDL has consisted of groundwater monitoring for VOCs, SVOCs, and radiological parameters. Table 4-16 presents detectable groundwater monitoring results for organics collected since the RFI and data collected in accordance with the agency-approved RFI recommended sampling. These data are current through June 2004 and are compared to NYSDEC's TOGS 1.1.1 groundwater quality standards, as well as to site background, where applicable.

Observed historical and current groundwater conditions are as follows:

Volatile Organic Compounds: No VOCs have been detected above groundwater standards at monitoring wells 801 or 803, and only one very low methylene chloride detection in well 804 at 8.4 µg/L, which slightly exceeded its TOGS 1.1.1 water quality standard (5 µg/L) that were recommended for post-RFI sampling. Groundwater discharge seep SP12 reported levels of 1,1-dichloroethane (1,1-DCA) at a concentration of 6 µg/L, which was above its TOGS 1.1.1 water quality standard of 5.0 µg/L in a lone September 1996 sampling event. Downgradient monitoring well 8612 has reported concentrations of 1,1-DCA, 1,2-dichloroethene (1,2-DCE) (trans), dichlorodifluoromethane (DCDFM), and 1,1,1-trichloroethane (1,1,1-TCA) above TOGS 1.1.1 water quality standards. 1,1,1-TCA was detected in well 8605 at a concentration of 6 µg/L (estimated), which was above its TOGS 1.1.1 water quality standard of 5.0 µg/L in a lone September 1996 sampling event. DCDFM has been detected sporadically between December 1995 and September 2002 at concentrations ranging from approximately 6 µg/L to 8 µg/L (TOGS 1.1.1 water quality standard is 5 µg/L). 1,2-DCA concentrations have decreased from 40 µg/L in December 1995 to 9 µg/L in June 2004 (TOGS 1.1.1 water quality standard is 5 µg/L). 1,2-DCE (trans) has been detected from December 1995 through June 2004. The concentrations increased from approximately 10 µg/L in December 1995 to 39 µg/L in December 2001 and now have decreased to 24 µg/L in June 2004 (TOGS 1.1.1 water quality standard is 5 µg/L).

Semivolatile Organic Compounds: No SVOCs have been detected above groundwater standards at the two monitoring wells, 803 or 8612 that were recommended for post-RFI sampling.

Radiological Parameters: Concentrations in groundwater of the radiological indicator parameter at groundwater seep location SP12 indicate that gross alpha, gross beta, and tritium levels have decreased over the monitoring period (Figure 4-10).

4.8.4 Conclusions and Recommendations

The majority of the waste in the CDDL is reported to be inert construction and demolition debris and on-site generated solid waste, and there is no documented evidence that RCRA-hazardous waste was disposed of in the CDDL. The landfill was closed pursuant to 6 NYCRR §360-7.6 and approved by NYSDEC in their October 28, 1986 correspondence (Appendix A).

A review of the post-RFI groundwater data indicates that low levels of 1,1-DCA, 1,2-DCE (trans), DCDFM, and 1,1,1-TCA have been historically detected slightly above their respective TOGS 1.1.1 water quality standards. No SVOCs were detected in downgradient monitoring wells.

The results indicate that under current land use conditions, the CDDL poses minimal health risks to on-site personnel and the general population, and that significant environmental impacts are not anticipated. Although some compounds were detected downgradient of the CDDL in soil and groundwater samples, these are at low levels, and constituent concentrations are decreasing, and the pathways hydraulically isolated from potential off-site groundwater receptors. As such, the potential for exposure to these compounds is minimal. Based upon the results of the RFI, the final report concluded that no further action was deemed necessary other than continued groundwater monitoring and landfill cap maintenance, as necessary. Consistent with the RFI recommendations, additional groundwater data for metals was collected to support statistical evaluations showing results within background ranges. NYSDEC and EPA accepted the RFI Report and summarized their conclusions and recommendations in their August 27, 1996 correspondence (Appendix A). Monitoring results subsequent to the RFI support that the ongoing monitoring and maintenance is appropriate and RCRA Correction Action should be considered complete with the controls currently in place.

4.9 SSWMU #9 NRC-Licensed Disposal Area (NDA)

SSWMU #9, identified as the NDA, is located approximately 1,200 ft (366 m) southeast of the Process Building and covers an area of 5.1 acres (2.1 ha). The NDA is bounded by Erdman Brook to the north and the SDA to the east. It consists of the NDA proper, the Kerosene Tanks, the Interim Waste Storage Facility (IWSF), the Trench Interceptor Project, the NDA Trench Soil Container Area, and the Staging Area for the NDA. Radioactive solid waste was disposed at the NDA by NFS from 1966 to 1982 and the WVDP from 1982 to 1986. The six SWMUs which collectively comprise SSWMU #9 include:

- SWMU #2 - NRC-Licensed Disposal Area,
- SWMU #11 - the Kerosene Tanks,
- SWMU #11a - IWSF,
- SWMU #23 - the Trench Interceptor Project
- SWMU #31 - NDA Trench Soil Container Area

- SWMU #39 - Staging Area for the NDA

The information presented in the following subsections has been summarized from the document entitled *Resource Conservation and Recovery Act Facility Investigation Report, Volume 2, Nuclear Regulatory Commission-Licensed Disposal Area* (WVDP-RFI-018) (WVNSCO, September 1995).

4.9.1 Description and Operational History

SWMU #2: The NDA was licensed in 1963 by the U. S. Atomic Energy Commission (now the NRC). The license stipulated that all solid radioactive wastes were to be buried completely within the silty till; burial was to be restricted to the area drained by Erdman Brook and Frank's Creek; the cover had to be a minimum of 4 ft (1.2 m) of silty till over the waste as measured down from the top of the undisturbed silty till stratum; and waste markers (cairns) and disposal records were to be maintained. No other specific design or maintenance criteria were identified in the license for the disposal area. The waste burial area is a rectangle measuring approximately 370 ft by 600 ft (113 m by 183 m); its four corners are marked by concrete cairns. The waste burial area was used by both NFS and WVDP for disposal of solid radioactive waste.

SWMU #11/11a: The Kerosene Tanks and NDA Container Storage Area is now referred to as the IWSF. The IWSF is a RCRA interim status container storage unit constructed as a 35-ft (10.7-m) by 35-ft (10.7-m) by 15-ft-high (4.6-m) metal building that is anchored to a concrete slab foundation along the north side of the disposal area. An 8-inch-high (20-cm) berm surrounds the epoxy-coated concrete floor to provide secondary containment capacity. Attached to the IWSF is a 10-ft (3.1m) by 15-ft (4.6-m) metal frame shed anchored to a concrete slab to house the high-expansion foam fire suppression system.

The IWSF was constructed in 1985 to house the kerosene tanks and treatment system for the TBP/n-dodecane mitigation project (i.e., NDA Trench Interceptor Project). The IWSF was not used for that purpose since pretreatment of water collected by the NDA interceptor trench was not needed. In 1990, this unit was included in the RCRA Part A Permit application as an interim status container storage and treatment unit. The IWSF has since been used for the storage of solid and liquid radiological, mixed, and hazardous wastes in containers. The container sizes managed in the IWSF range from 0.01 gal. (50 milliliters) to 55 gal. (189 L). In addition, wastes undergoing waste characterization are stored in this building awaiting analytical results to determine the appropriate long-term waste storage location or off-site disposal. The IWSF has also been used for the preparation of radiological waste shipments. One holding tank located within a temporary weather structure was used in 1986 to temporarily store radioactively-contaminated liquid removed from TBP/n-dodecane storage tanks excavated from the NDA.

SWMU #23: The Trench Interceptor Project is located along the northwest and northeast boundaries of the burial area. The interceptor trench was completed in 1991 and was designed to collect groundwater and any TBP/n-dodecane that was migrating through the weathered Lavery till from the NDA.

The trench is approximately 4-ft wide (1.2 m), 12 to 16-ft (3.7 to 4.9 m) deep, and 875-ft (266.7 m) long with a 1% to 6% slope along the bottom. The trench is lined with a non-woven polyester geotextile fabric and is backfilled with pea gravel. A 7-in. (18 cm) perforated drain pipe at the bottom of the trench directs intercepted groundwater to a sump for collection. A compacted clay cap was placed over the interceptor trench to protect against rainwater intrusion. There are seven manholes along the trench that are used to maintain and inspect the piping system.

The interceptor trench was initially pumped approximately twice per week; however, seasonal fluctuations and precipitation affected the water volumes collected and therefore the pumping frequencies. Capping activities at the interceptor trench were completed in April 1991 and were followed by a sharp decline in water volume pumped from the trench. Other than during the winter, collected water is automatically pumped from the sump in Manhole 4 to Lagoon 2. In the calendar year 2003, 370,000 gal (1,400,000 L) of groundwater were pumped from the collection trench for treatment. Groundwater levels in the vicinity of the trench are recorded quarterly and evaluated to ensure that an inward hydraulic gradient exists. The results of this evaluation are summarized in a quarterly report that is transmitted to the NYSDEC and the EPA.

SWMU #31: The NDA Trench Soil Container Area is discussed separately in Section 5.7.

SWMU #39: The Staging Area for the NDA, alternately known as the NDA Hardstand, is discussed separately in Section 5.15.

4.9.2 Wastes Managed at SSWMU #9

SWMU #2: Historically, the materials disposed in the NDA were categorized according to the radioactivity of the waste based on facility operating logs. Chemical data, not being required by the operating license, was never generated for the wastes. Consequently, the chemical characterization of the waste streams developed for this report has been based upon historical knowledge and other records of site operations.

Since the NDA disposal operations were concluded prior to the effective date for RCRA regulations of mixed wastes, no known RCRA-regulated hazardous wastes were disposed in the NDA. Documentation does indicate, however, that RCRA hazardous constituents (6 NYCRR §371, Appendix 23) are associated with some of the materials discarded in the unit.

The exact quantity of chemical contaminants located in the NDA is unknown, but the physical characteristics of wastes known to have been buried in the NDA in any amount have been compiled. It was the general practice that liquids were absorbed with vermiculite before disposal. Therefore, in all instances where liquids have been identified in the following summary, it is assumed they were disposed with absorbent unless otherwise noted. Based upon available documentation, disposal records, and employee interviews, LLW and mixed LLW have been identified as having been disposed in the NDA.

Based on information provided in the RFI Report (WVDP-RFI-018) (WVNSCO, September 1995) and revised RFI Report text, as provided to NYSDEC and EPA and documented in the Agencies' July 23, 1996 correspondence (Appendix A), the Agencies concurred that no listed wastes were disposed in the NDA and "Therefore, groundwater contaminated with leachate would not have to be managed as hazardous waste."

SWMU #11/11a: Uncharacterized wastes, RCRA-regulated hazardous wastes, and mixed radioactive wastes are managed at the IWSF. As of September 30, 2004, there were 59 mixed waste containers at the IWSF. These wastes consist of petroleum products containing PCBs, mercury wastes (e.g., broken light bulbs), and A&PC laboratory generated mixed wastes as a result of chemical and radiological analyses of process control samples. These wastes include laboratory samples, organic extraction wastes, plutonium scintillation wastes, plutonium aqueous waste, strontium organic wastes, and other laboratory wastes.

Other types of wastes historically stored in this facility included wastes generated as a result of the reproduction of photographs and blueprints; paints and paint strippers; lead-acid batteries; zinc bromide solutions; and other wastes generated from general maintenance activities.

SWMU #23: The trench was designed to capture groundwater migrating through the NDA, which may contain n-dodecane and TBP for transfer to Lagoon 2.

Spills: There have been no spills of a character or volume in SSWMU #9, which would have required an immediate regulatory report as tracked in the WVDP's spill database previously discussed in Section 4.1.2. The spills of record were contained and cleaned up promptly and appropriately. The wastes, residues, and clean up materials were collected and dispositioned in accordance with regulatory requirements and WVDP procedures.

4.9.3 Environmental Characterization

4.9.3.1 Pre-RFI and RFI Environmental Monitoring

Groundwater Sampling Program: Groundwater samples collected from six wells in the Kent recessional unit were analyzed for contaminant indicator parameters from March 1991 through 1992.

Groundwater sampling from three monitoring wells were attempted in December 1989 within the NDA. Two of the three wells contained a TBP/n-dodecane layer. The samples were originally intended to be analyzed for Appendix 23 VOCs, SVOCs, pesticides, metals, dioxin, SPDES parameters, and a radioisotopic scan. However, only one well was sampled for all analytical parameters. The other two wells went dry before sampling was completed and were not analyzed for metals due to insufficient sample volume.

Two rounds of groundwater sampling (fourth quarter of 1993 and second quarter of 1994) were performed for the RFI. Two samples from each of five wells completed in the weathered Lavery till and the interceptor trench sump (WNNDATR) were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals.

Groundwater samples collected from three unweathered Lavery till and six Kent recessional unit wells were also analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals.

Shallow Soil Sampling Program: Twenty-five shallow soil sampling locations were selected from a review of the 1990 site-wide overland gamma survey and site operational history. Composite soil samples were collected at each shallow soil sampling location. Four soil sampling locations were analyzed for TCL SVOCs, TCL pesticides and PCBs, and TAL metals two of the four were additionally analyzed for TCL VOCs.

Deep Soil Sampling Program: Twenty-three soil samples, collected from two boreholes augered to depths of 19 ft (5.8 m) and 27 ft (8.2 m) in the weathered Lavery till, were analyzed for TCL VOCs and SVOCs, and TAL metals.

Stream Sediment Sampling: Surface drainage from the NDA collects in either Erdman Brook or Lagoon Road Creek, which are located to the north and the east of the NDA. Stream sediment was collected from two locations in Erdman Brook and at one location in Lagoon Road Creek. The sediment collected from these locations was analyzed for TAL metals and radioisotopes.

Surface Water Sampling: Surface water at WNNDATR was sampled on June 9, 1994 and was analyzed for TCL VOCs and SVOCs.

The analytical results of all RFI environmental sampling at SSWMU #9 are summarized in Table 4-17.

4.9.3.2 Post-RFI Environmental Monitoring

Post-RFI monitoring at the NDA has consisted of groundwater monitoring for radiological parameters and Appendix 23 VOCs, SVOCs, and metals. Routine groundwater monitoring since the RFI has been performed for wells 901, 902, 903, 906, 908, 909, 910, 1005, 1006, 1008C, 8610, 8611, and NDATR. Analytical data indicate that no RCRA-hazardous constituents have been detected at levels of concern as discussed below.

Volatile Organic Compounds: No VOCs have been detected above TOGS 1.1.1 water quality standards at Well 909 or interceptor trench sump sampling point WNNDATR, the two SSWMU #9 locations recommended for RCRA sampling.

Semivolatile Organic Compounds: No SVOCs have been reported at concentrations above TOGS 1.1.1 groundwater quality standards, except for a sample analyzed in June 1996, which was reported at an estimated phenols concentration of 3 μg/L (Table 4-18). Phenols were detected in the duplicate for this sample. The TOGS 1.1.1 water quality standard for phenols is 1 ug/L. No additional phenols detections have been reported since the June 1996 detection.

TAL Metals: Since 1995, there has been a single detection of total cobalt (5.4 μg/L) in a December 2000 sample from Well 909, and a single detection of selenium (11 μg/L) from well NDATR, which slightly exceeded their TOGS 1.1.1 water quality standards of 5 μg/L and 10 μg/L, respectively (Table 4-19). No background concentration has been established at the WVDP for cobalt. The concentration of selenium was well below site background and as such reflects a typical level of natural variation.

Radiological Parameters: Groundwater concentrations in the weathered Lavery till for the radiological indicator parameters gross alpha, gross beta, and tritium indicate that the trends (Figures 4-11, 4-12, and 4-13) are generally stable, except for well 909 and well NDATR. The gross beta trend at wells 909 and NDATR have been gradually increasing since the RFI. In addition, the tritium trend for well NDATR has been steadily decreasing since the RFI (Figure 4-12). As first pointed out in the RFI, this disparity between the decreasing gross alpha and tritium, and the increasing gross beta, is most likely due to residual radioactivity remaining from past operations at the NDA. The gross alpha, gross beta, and tritium indicator parameters have trended lower since the RFI in the unweathered Lavery till as monitored at well 910 (Figure 4-14). Radiological indicator parameters have also been monitored at wells 901, 902, 903, 8610, and 8611 in the Kent recessional unit. The trends for gross alpha, gross beta and tritium have been either stable or trending lower since the RFI (Figure 4-15 and 4-16). Radiological isotopes have also been monitored at wells 909 and NDATR. Radioisotope trends for these wells are grouped together as alpha emitters and beta/gamma emitters in Figures 4-17 through 4-22. These data indicate radium isotopes are trending lower while uranium isotopes are trending slightly higher for well NDATR (Figure 4-17) and trending lower for well 909 (Figure 4-20). The beta emitting isotope trends are generally stable, except for Sr-90 (Figures 4-18 and 4-21). The only gamma emitting isotope measured, Cobalt-60, has consistently been measured in both wells at approximately zero (Figures 4-19 and 4-22).

4.9.4 Conclusions and Recommendations

The RFI report concluded that no further action was necessary for SSWMU #9, except for continued monitoring of groundwater, surface water, and the interceptor trench effluent at WNNDATR. These activities have been implemented and continue as discussed in the previous section. The recommendations of the RFI were determined to be acceptable for the “short-term” by both the EPA and the NYSDEC in correspondences dated January 24, 1996, and July 23, 1996 (Appendix A). The groundwater monitoring program continues to support the results of the RFI by providing data that are essentially below regulatory levels or within site background levels. These data support the previous conclusion that continued monitoring is appropriate to ensure protection of public health and the environment from any potential contamination originating from SSWMU #9.

The IWSF (SWMU #11/11a) has been an active Interim Status hazardous waste management unit and the continued operation has been handled according to RCRA operating requirements. Additionally, this unit is subject to RCRA closure under interim status or final status standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #20.

A decommissioning EIS is being prepared for the WVDP and WNYNSC that will also address closure of the NDA (SWMU #2) and the associated Trench Interceptor Project (SWMU #23). It is anticipated that upon approval of the final Decommissioning EIS, RCRA Corrective Action requirements will be addressed.

4.10 SSWMU #10 Integrated Radwaste Treatment System Drum Cell

SSWMU #10 is identified as the RTS Drum Cell. The RTS Drum Cell is the only SWMU (#21) of SSWMU #10. The RTS Drum Cell is the final staging area for solidified waste generated from treatment activities associated with the IRTS, which includes the STS, the LWTS, and the CSS. The Drum Cell is used for the storage of cement-solidified LLW.

The information presented in the following subsections has been summarized from the document entitled *West Valley Demonstration Project RCRA Facility Investigation Work Plan* (WVDP-RFI-014) (WVNSCO, December 1993).

4.10.1 Description and Operational History

The RTS Drum Cell is located south of the NDA and west of the SDA on the South Plateau. The Drum Cell consists of a concrete base pad, shielded walls, and waste-handling equipment inside a pre-engineered steel building. A 15-ft-high (4.6-m) by 20-inch-thick (51-cm) reinforced concrete shield wall surrounds the pad. The building is 375 ft (114 m) by 60 ft (18 m) by 26 ft (8 m) high. The floor perimeter is lined with a berm and the floor and berm are coated with epoxy.

The RTS Drum Cell equipment consists of a bridge, crane, and trolley. The bridge is approximately 55 ft (17 m) in length and is oriented east to west within the Drum Cell. The trolley travels north and south along the bridge. A 4,000-lb-capacity (1,818-kg) crane is attached to the hoist and trolley. A 2,000-lb (909 kg) grabber, a crane attachment, and a power rotating lifting device is used to pick up and hold the square 71-gal (269-L) drums along their axis angle as it moves the drums parallel to the drum stack. Drums are placed at their respective coordinates in the drum stack.

The equipment for the RTS Drum Cell is operated from control panels located in the control room. Operations are initiated from the control room. All waste handling is performed remotely so that personnel exposure levels to radiation are minimized. The waste unloading area is a shielded area at the north side of the RTS Drum Cell. Remote unloading of drums takes place in this area.

The RTS Drum Cell began storing cement-solidified waste in 1987. The waste, decontaminated supernatant salts, and sludge wash solutions were processed through IRTS, including CSS. These treatment activities were completed in 1995. Sample results confirm that the cement-solidified wastes are not RCRA characteristic hazardous wastes. There are approximately 20,000 drums of solidified wastes stored in the RTS Drum Cell.

The RTS Drum Cell wastes met the LDR treatment standards (the 2nd third) at the time of treatment and according to the “grandfather clause” of 40 CFR 268-40(h) and 6 NYCRR §376.4(a)(8) under the LDR standards.

4.10.2 Wastes Managed at SSWMU #10

Cement-solidified wastes stored in the RTS Drum Cell were generated from IRTS processing, including the CSS. The CSS solidified liquid LLW in a Portland cement matrix. The CSS was designed to solidify three WVDP waste streams (uranyl nitrate hexahydrate [UNH], decontaminated supernatant, and sludge wash from the HLW storage tanks) through mixing with Portland Type 1 cement. UNH wastes were processed, but stored in the LAG Storage waste complex.

PUREX wastes consisted of PUREX supernatant and sludge wash solutions. The supernatant-solidified waste created by IRTS processing had been rendered nonhazardous waste as determined by sample analysis. The PUREX sludge wash solution waste solidified by IRTS processing had been sampled and analyzed for EP toxicity and TCLP parameters. As a result of this analysis, the solidified form is not a RCRA characteristic waste. Due to the stabilized, nonhazardous characteristic of the waste, container (drum) integrity and containment procedures, the potential for the release of waste or constituents to the environment is virtually nonexistent.

4.10.3 Environmental Characterization

4.10.3.1 Pre-RFI and RFI Environmental Monitoring

The location of the RTS Drum Cell was an undisturbed area prior to its construction. The initial investigation and assessment of this area during the RFI concluded that there was no potential release of RCRA constituents to the environment. Therefore, no sampling activities were performed.

4.10.3.2 Post-RFI Environmental Monitoring

Post-RFI data has been generated for radiological indicator parameters. These data are presented in Section 4.9.3.2 and Figure 4-13, related to monitoring wells 1005, 1006, and 1008C. The trends for the individual indicator parameters monitored at these wells are either slightly decreasing or decreasing over time.

4.10.4 Conclusions and Recommendations

The RFI Work Plan was approved by the NYSDEC and EPA in their correspondence dated September 30, 1993 (Appendix A). Based on the recommendations provided in the RFI Work Plan; cement-solidified waste analytical data; agency approval of the RFI Work Plan; and results of post-RFI radiological indicator parameter groundwater sampling, RCRA Corrective Action should be considered complete for SWMU #21.

4.11 SSWMU #11 State-Licensed Disposal Area (SDA)

The SDA (SSWMU #11) is not located within the WVDP boundary and is the responsibility of the NYSERDA and therefore not discussed within this document.

4.12 SSWMU #12 Hazardous Waste Storage Lockers

SSWMU #12 is identified as the Hazardous Waste Storage Lockers (HWSLs) numbers 1-4. The HWSLs are the only SWMU (#24) within SSWMU #12. The HWSLs have been used to store containerized nonradiological solid and liquid hazardous wastes awaiting off-site disposal.

The information presented in the following subsections has been summarized from the document entitled *West Valley Demonstration Project RCRA Facility Investigation Work Plan* (WVDP-RFI-014) (WVNSCO, December 1993).

4.12.1 Description and Operational History

The HWSLs are located on the North Plateau, north of the Process Building and south of the LSA #2 Hardstand. Each locker is identical in size and fabrications; 8 ft (2.4 m) by 15 ft (4.6 m) by 8 ft (2.4 m) high, providing 960 ft^3 (25 m^3) of storage capacity. Each of the four lockers is constructed with a spill basin beneath a steel grate floor that provides 255 gal (965 L) of secondary containment capacity. All four lockers are equipped with fire suppression devices, remote and local fire alarm systems, explosion-proof electrical components, vents, and relief panels.

The HWSLs were placed on site in 1990 and originally used as 90-day storage areas until being listed in the 1993 RCRA Part A Permit Application as Interim Status container storage units. The lockers have been used to store containerized nonradiological solid and liquid hazardous wastes awaiting off-site disposal. HWSL #2 has been designed for the storage of PCB waste. Weekly inspections of the HWSLs have been performed since their installation in 1990

4.12.2 Wastes Managed at SSWMU #12

The hazardous wastes stored in the HWSLs are from various WVDP operations and facilities, such as WVDP laboratories, the warehouse, and general maintenance activities. Items, including paint cans, refractory brick, reproduction fluid, laboratory standards, and solvent-contaminated absorbents, are stored in specific lockers based on compatibility and capacity. Strong oxidizers, strong alkali, and magnesium wastes may be placed in secondary containment to provide an addition level of protection against a release. Wastes are typically contained in 55-gal drums and 5-gal pails. Because the lockers are temporary storage units, the inventory and types of containers used fluctuate over time.

4.12.3 Environmental Characterization

4.12.3.1 Pre-RFI and RFI Environmental Monitoring

The initial investigation and assessment of this area during the RFI concluded that there was no potential release of RCRA constituents to the environment, prior to or during the use of the HWSLs, up through the RFI. Therefore, no sampling activities were performed.

4.12.3.2 Post-RFI Environmental Monitoring

Since the HWSLs are located proximal to the LAG storage areas (SSWMU #6), the post-RFI monitoring data associated with SSWMU #6 can be correlated to the HWSLs. (See text in Section 4.6.2.3) Radiological indicator data proximal to this unit from wells 602, 604, and 605 (Figure 4-8) and well 8607 immediately downgradient (Figure 4-7) all show decreasing trends with the exception of gross beta at well 8607.

Spills: There have been no releases of hazardous wastes to the environment as a result of waste management activities at the HWSLs. Any minor spills that have occurred within the lockers during their active waste management period have been cleaned up promptly and residues or cleanup materials associated with these spills were collected and dispositioned appropriately.

4.12.4 Conclusions and Recommendations

The RFI Work Plan was approved by the NYSDEC and EPA in their correspondence dated September 30, 1993 (Appendix A). Additionally, the HWSLs are subject to RCRA closure under Interim Status or Final Status Standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #24.

4.13 Sealed Rooms

The Sealed Rooms are grouped within SSWMU #3 for evaluation in the RFI activities. In the RFI Work Plan, 11 Sealed Rooms were identified as part of SSWMU #3. Based on historical knowledge, limited testing, and plant operations, the Sealed Rooms were specifically identified as either inaccessible or their access is restricted due to very high radiation levels; therefore, they could not be initially characterize pursuant to RCRA. A separate report entitled *Sealed Rooms Paper Characterization* (WVDP-RFI-016) (WVNSCO, May 1994) was submitted to NYSDEC and EPA for review, which supplemented the RFI Work Plan information.

4.13.1 Description and Operational History

The Sealed Rooms, which are located in the Process Building, were designed and utilized in the process to recover uranium and plutonium from spent nuclear fuel. The physical and chemical reprocessing operations were conducted in specially designed cells, room, and aisles within the Process Building. The cells were shielded enclosures with limited access where fuel was physically and chemically processed. The cells were designed to support reprocessing operations and the aisles were designed for personnel occupancy to remotely control the physical and chemical fuel reprocessing within cells. The Sealed Rooms consist of the following initial 11 cells:

Extraction Cell #1
Extraction Cell #2
General Purpose Cell
Hot Acid Cell
Liquid Waste Cell
Miniature Cell
Off-Gas Blower Room
Process Mechanical Cell
Ram Equipment Room
Upper Warm Aisle (UWA) Pump Niches
Ventilation Wash Room

In addition, six associated rooms were added to the grouping by NYSDEC in their correspondence dated December 12, 1994 (Appendix A), include:

Acid Recovery Cell (ARC)
Acid Recovery Pump Room (ARPR)
Master Slave Manipulator (MSM)
Off-Gas Cell
Scrap Removal Room (SRR)
SST

Nuclear Fuel was reprocessed from April 1966 until early 1972, when the Process Building was shut down for modification and expansion purposes. Since the facility did not become operational again, decontamination activities have been conducted in several of the identified rooms since 1972. Table 4-20 summarizes the operational history specific to each cell/room.

4.13.2 Wastes Managed in Sealed Rooms

The wastes managed and/or generated in the Sealed Rooms are summarized in Table 4-20.

4.13.3 Environmental Characterization

4.13.3.1 Pre-RFI and RFI Environmental Monitoring

The Sealed Rooms are associated with SSWMU #3. The pre-RFI and RFI data are presented in Section 4.3.3.1 and Table 4-6.

4.13.3.2 Post-RFI Environmental Monitoring

The Sealed Rooms are associated with SSWMU #3. The post-RFI data are presented in Section 4.3.3.2, Tables 4-7 and 4-8, and Figures 4-4, 4-5, and 4-6.

4.13.4 Conclusions and Recommendations

Based on the Sealed Rooms Report and review of the preliminary groundwater sampling data, it appears that the Sealed Rooms do not pose a significant threat from the release of hazardous waste or hazardous waste constituents to the environment. The Agencies also requested additional information (December 12, 1994, Appendix A) for some Sealed Rooms and indicated that the RFI data should still be evaluated.

The results of the RFI did not indicate the presence of a release of RCRA-regulated hazardous constituents or waste from SSWMU #3. The RFI report concluded that no further action was necessary for the LWTS, except for continued groundwater monitoring at wells 103, 204, 301, 401, 408, and 8609. NYSDEC and EPA concurred with the conclusions and recommendations of the RFI Report in their March 6, 1997 correspondence (Appendix A) and added "…the only further action necessary for this unit are continued groundwater monitoring required by the WVDP Groundwater Monitoring Plan." Upon completion of the RFI, the Agencies also provided a response dated January 22, 1998 (Appendix A), which stated "…Review of soil sampling data and routine groundwater monitoring taken in the vicinity of the process building support the conclusion the sealed rooms do not pose a significant threat from release of hazardous waste or hazardous constituents." and "Therefore, the only further actions necessary at this time for the Sealed Rooms is continued groundwater monitoring required pursuant to the West Valley Demonstration Project's Groundwater Monitoring Plan."

These activities have been implemented and continue as discussed in the previous section. The recommended post-RFI groundwater monitoring data continue to support the conclusion of the RFI that there has not been a release of RCRA-regulated hazardous constituents to the environment. In addition, D&D activities have been or are being performed for several of the Sealed Rooms. This information including mixed waste generated, has been provided to NYSDEC and EPA in RCRA §3008 (h) Quarterly Reports.

Based on their location within the Process Building, final decommissioning will be addressed in the Decommissioning EIS. It is anticipated that upon approval of the final Decommissioning EIS, RCRA Corrective Action requirements will be addressed.

5.0 SUMMARY OF INDIVIDUAL SWMUs

5.1 SWMU #12/12a: Vitrification Test Facility Waste Storage Tanks

5.1.1 Description and Operational History

The Vitrification Test Facility Waste Storage Tanks are associated with the Vitrification Test Facility. The building is an approximate 43-ft (13.1-m) by 120-ft (36.6-m) metal building that is anchored to an 8-inch-thick (20-cm) concrete slab foundation. A 6-inch-high (15-cm) berm is present around the floor perimeter. The concrete floor and berm are coated with carbolene paint.

This unit included two aboveground stainless steel storage tanks. One stainless-steel tank (65-D-01), the Waste Feed Storage tank, was used to prepare and store nonradioactive simulated-waste feed to simulate the HLW that would be treated by the VF in the WVDP's mission of HLW solidification. This tank was located on a curbed concrete pad within the Vitrification Test Facility building and had a capacity of 11,000 gal (41,635 L). The second stainless-steel tank (61-D-07), the Scaled Vitrification System Scrubber Solution Hold Tank, was used to hold off-gas scrubber solution during two phases of scaled vitrification system operation and then to store RCRA nonhazardous system rinse water in subsequent testing. This tank is situated outside the north wall of the Vitrification Test Facility within a secondary containment vessel designed to hold 110% of the tank's 6,000-gal (22,710-L) capacity.

These two tanks were used during nonradiological and functional checkout testing of the vitrification systems prior to the HLW vitrification. The melter feed chemical storage tank (65-D-01) was operated from late 1985 to November 1989. Upon completion of test operations, this tank was moved to, and has remained, in the Cold Chemical Building located northwest of and adjacent to the vitrification cell where it served as a temporary waste catch tank for off-specification melter feed materials. The scrubber solution hold tank was used during testing performed between 1985 and 1989. This tank is no longer used, has been emptied, and all ports have been blanked and sealed.

There are no known occurrences of uncontained releases from either of these tanks to the environment. This information is further supported by the field sampling results discussed below.

5.1.2 Wastes Managed at SWMU #12/12a

As discussed above, no hazardous wastes were stored in tank 61-D-07. Liquid wastes transferred to tank 65-D-01 in the Cold Chemical building were conservatively classified as hazardous and subsequently removed. With the completion of vitrification activities, this tank is being removed from service.

5.1.3 Investigations and Findings

In 1991, routine groundwater monitoring was initiated for monitoring wells adjacent to SSWMU #4. RFI sampling activities (soil, groundwater, and sediment) for the Vitrification Test Facility were performed in 1993 and 1994, followed by the submittal of an RFI Report (WVDP-RFI-024) (WVNSCO, April 1997) to EPA and NYSDEC. Analytical results from the RFI did not indicate the presence of a release of hazardous constituents from this unit. Analytical data is summarized in Section 4.4.3, Tables 4-9 and 4-10 and Figure 4-7.

5.1.4 Conclusions and Recommendations

Based on the groundwater monitoring data reviewed and data collected for the RFI; the unit no longer being used for scale vitrification testing; closure and/or removal of associated tanks; agency acceptance (February 11, 1997, Appendix A) of the RFI Report conclusions; and no recommendation for continued groundwater monitoring associated with SWMU #12/12a, RCRA Corrective Action should be considered complete for SWMU #12/12a.

5.2 SWMU #26: Subcontractor Maintenance Area

5.2.1 Description and Operational History

The Subcontractor Maintenance Area is an area approximately 20 ft (6.1 m) by 30 ft (9.1 m) located on the South Plateau portion of the WVDP. The area is flat, covered with compacted stone, and is adjacent to a paved roadway. Prior to 1991, a WVDP construction subcontractor had used this area to clean asphalt paving equipment by spraying the equipment with diesel fuel. The diesel fuel would soak into the asphalt that coated the equipment and aid in its removal. During these cleaning operations, some of the diesel fuel and asphalt material dripped off the equipment and fell onto the ground surface. In November 1991, the area was remediated and site policy was amended to prohibit the use of diesel fuel for equipment cleaning. The remediation involved removing the upper 6 inches (15 cm) of soil and replacing the exhumed soil with clean gravel. The exhumed soil was tested for TCLP parameters and disposed as a RCRA nonhazardous solid waste. Since 1991, the area has been used for a staging area for heavy equipment and inert construction materials (e.g., stone, gravel, etc.).

5.2.2 Wastes Managed at SWMU #26

In general, this area was used for the staging and cleaning of asphalt paving equipment, followed by the staging of stone backfill material. The wastes generated from cleanup of this area were principally petroleum based products including diesel fuel, motor and hydraulic oils, and asphalt.

5.2.3 Investigations and Findings

A formal site inspection was conducted with an on-site NYSDEC coordinator during the fall of 1993. During this inspection, no signs of discharge, such as soil discoloration, were evident. This inspection also included the collection of one discrete surface soil sample (SS-17) and four surface soil samples within 3 ft (1 m) of SS-17 (for compositing) of the underlying the recently-emplaced gravel layer for analysis of TCL VOCs and SVOCs, and TAL metals. The analytical results of the soil sample(s) indicated the presence of acetone below its TAGM 4046 cleanup level and methylene chloride in a trip blank, as well as below its TAGM 4046 cleanup value. Metals detected in the composite sample were below TAGM 4046 cleanup levels and/or three times soil background levels.

In addition, pre-RFI and RFI groundwater sampling data generated from 1991 through 1994 for wells 908, 1005, and 1008C were evaluated to determine whether activities at this unit may have impacted groundwater quality. Analytical results did not indicate the exceedance of TOGS 1.1.1 groundwater quality criteria or site background concentrations (See Section 4.9.3.2).

5.2.4 Conclusions and Recommendations

Based on the fact that there were no signs of discharge (i.e., soil discoloration) during the 1993 inspection; results of the RFA report (WVNSCO, August 1994); current use of the unit; and agency concurrence with the RFA report (January 12, 1995, Appendix A), "a determination of no further action" was made by the regulatory agencies. Given this determination, RCRA Corrective action should be considered complete for SWMU #26.

5.3 SWMU #27: Fire Brigade Training Area

5.3.1 Description and Operational History

The Fire Brigade Training Area is an approximate 20-ft (6.1-m) by 20-ft (6.1-m) vacant field north of Lagoons 4 and 5, and south of the CDDL, on the North Plateau. This area was used from two to four times a year, between 1982 and 1993, for the purpose of fire training exercises. Available documentation indicates that all training exercises were conducted pursuant to the Restricted Burning Permits issued for the training area. During the fire training exercises, wood was piled up, coated with kerosene or diesel fuel, ignited, and then extinguished with water and/or foam. Another exercise conducted was to place water in a shallow metal pan, add diesel fuel, and then ignite the mixture. The burning fuel was extinguished using a steady stream of water and/or foam.

5.3.2 Wastes Managed at SWMU #27

Given the operational history of the Fire Brigade Training Area described above, wastes managed there have been wood ash and residual kerosene or diesel fuel. It is possible that some of the fire extinguishing water and/or foam could have spilled over the edge of the training fire pan carrying fuel with it, which then could have been absorbed by soil.

5.3.3 Investigations and Findings

A Fire Brigade Training Area SWMU Assessment Plan, which included a preliminary review, visual site inspection, and a sampling visit was implemented by DOE. Existing data from 1991 groundwater monitoring well (602, 105, and 8603) data was reviewed as part of the plan, as well as that of ongoing groundwater monitoring for 1992, 1993, and 1994. The September 1993 visual inspection identified two distinct areas of the Fire Brigade Training Area as burn locations. Composite soil samples from these areas were analyzed for TCL VOCs and SVOCs, and TAL metals.

Soil analytical data were reported below regulatory levels or within established site background concentrations. In addition, groundwater analytical results were reported below regulatory levels or within established site background concentrations.

5.3.4 Conclusions and Recommendations

Based on analytical sampling results from the September 1993 inspection; results of the RFA Report (WVNSCO, March 1995); removal of equipment and materials from this unit and no current use for this area; and agency concurrence with the RFA Report (May 22, 1995, Appendix A), "a determination of no further action" was made by the regulatory agencies. Given this determination, RCRA Corrective action should be considered complete for SWMU #27.

5.4 SWMU #28: Vitrification Hardstand

5.4.1 Description and Operational History

The Vitrification Hardstand was a flat, graveled hardstand with dimensions of approximately 150 ft (46 m) by 200 ft (61 m) located on the North Plateau, southeast of the Process Building. The Vitrification Hardstand operated from 1984 to 1993 to store double-lined drums containing Melter refractory bricks and nonradiological vitrification test glass awaiting disposition. The drums were staged on pallets and covered with tarpaulins to prevent contact with precipitation. In addition, vitrification test equipment was also staged in this area.

5.4.2 Wastes Managed at SWMU #28

Representative waste characterization analytical data indicates that all analyzed material was TCLP nonhazardous except for brick from the lid of the melter being hazardous for chromium. The brick and lid from the test melter are stored at an on-site RCRA Interim Status container storage unit. The remaining nonhazardous materials were staged at the Vitrification Hardstand. Temporary office trailers were staged in this area after nonhazardous wastes were removed. These office trailers have since been removed in 2004.

5.4.3 Investigations and Findings

One historical spill/release of vitrification test glass was documented for this area, which was observed during a visual site inspection in November 1992. Analytical characterization of the Melter refractory brick indicated that only nonhazardous bricks were staged in this hardstand area and that the vitrification test glass was characterized as nonhazardous. There is no indication that any other release or spills have occurred at this SWMU.

5.4.4 Conclusions and Recommendations

Based on the nonhazardous characterization of the waste types staged in this hardstand; results of the PR Report (WVNSCO, June 1994); NYSDEC's Visual Site Inspection; and agency concurrence with the PR Report (November 21, 1994, Appendix A), RCRA Corrective action should be considered complete for SWMU #28.

5.5 SWMU #29: Industrial Waste Storage Area

5.5.1 Description and Operational History

The Industrial Waste Storage Area was an approximate 40 ft (12 m) by 100 ft (31 m) graveled pad gently sloped to provide for water runoff. This storage area is located east of the FRS area of the Process Building near the interceptors on the North Plateau. The Industrial Waste Storage Area was used historically for the staging of excess equipment from Process Building upgrades between 1976 and 1982. The equipment was predominantly piping, pipe fittings, and hardware. The material was stored on pallets and covered with tarpaulins. These materials were managed as nonhazardous wastes. From 1990 to 1992, the area was used for temporary storage of industrial waste prior to off-site transport. These containerized wastes were placed on pallets and covered with tarpaulins. The area has since been graveled, two metal lockers have been placed in the area for storage of lawn care equipment, and one lubrication locker has also been added to this area.

5.5.2 Wastes Managed at SWMU #29

Only industrial non-hazardous wastes were staged at the Industrial Waste Storage Area. Some of these wastes, such as well purge water and soils from spill cleanups of fuel and oil, may have contained hazardous constituents. Typical wastes managed at the Industrial Waste Storage Area included well purge water, sump water from the Vitrification Test Facility, cleanup soils and absorbents from fuel and oil spills, zinc bromide contaminated protective clothing, oil from shield windows, waste paper incinerator ash and vitrification test glass.

5.5.3 Investigations and Findings

No historical spills or releases have been documented for this area. In addition, no observations of spills/releases were observed during a visual site inspection in 1992. Additionally, the wastes stored in this area were characterized as nonhazardous waste.

5.5.4 Conclusions and Recommendations

Based on the nonhazardous characterization of the waste types staged in this area; no documented releases or spills; no signs of spills/releases observed during visual inspection; results of the PR Report (WVNSCO, June 1994); and agency concurrence with the PR Report (July 31, 1997, Appendix A), a determination of "no further action" was made by the regulatory agencies. Given this determination, RCRA Corrective action should be considered complete for SWMU #29.

5.6 SWMU #30: Cold Hardstand Area

5.6.1 Description and Operational History

The Cold Hardstand Area is an approximate 40 ft (12 m) by 100 ft (31 m) graveled pad located west of the CDDL and north of the CDDL roadway. This hardstand area is located northeast of the Process Building on the North Plateau. This hardstand was used as a general, nonradiological waste staging area from 1984 to 1993. Drum management in this area occurred from 1989 to 1993. Materials managed in this hardstand included pallets, empty drums, load test weights, insulated (asbestos) piping, drums of Portland cement, and drums of nonhazardous vitrification test glass. In addition, historical information indicates that containerized paint, used oil, and spill cleanup material were staged in the hardstand. These wastes were stored in drums, staged on pallets, and covered with tarpaulins. In 1989, approximately 20 drums of waste were stored on this hardstand pending on-site management. The hardstand has been used for equipment storage since 1993 and for empty drum crushing operations. Occasionally, heavy equipment was also staged in this area.

5.6.2 Wastes Managed at SWMU #30

Approximately 20 drums of liquid and solid waste were temporarily staged at the Cold Hardstand in 1989 awaiting characterization. Upon classification, the drums were transferred to the HWSLs and then transported to an off-site disposal facility. The hazardous constituents associated with these drums included toluene, xylene, naphthalene, dichlorobenzene, phenol and other organics in trace concentrations and lead. Additional drums of nonhazardous industrial wastes containing spent demineralizer resins, kerf cutting grit, blasting sand and cement dust, glass frit, concrete, rubbish, dirt, Portland cement and recyclable paint were also staged at the Cold Hardstand. The only material now staged in this area is empty drums and equipment to be re-used, such as test weights, piping, and construction materials.

5.6.3 Investigations and Findings

No spills or releases were documented for this area. In addition, no visual observations of spills/releases were observed during a visual site inspection in November 1992. The waste drums from waste characterization activities in 1989/1990 were subsequently transported to the HWSLs for storage prior to off-site disposal.

5.6.4 Conclusions and Recommendations

Based on the nonhazardous characterization of the majority of waste types staged in this area; no documented releases or spills; results of the PR Report (WVNSCO, June 1994); and agency concurrence with the PR Report (October 20, 1994, Appendix A), a determination of "no further action" was made by the regulatory agencies. Given this determination, RCRA Corrective action should be considered complete for SWMU #30.

5.7 SWMU #31: NRC-Licensed Disposal Area (NDA) Trench Soil Container Area

5.7.1 Description and Operational History

The NDA Trench Soil Container Area consists of two parcels; one located south of the NDA and the other located west of the NDA across the existing roadways. The gravel pad areas together encompass approximately 2 acres (0.8 ha) on the South Plateau. Prior to 1984, soil contained in roll-off containers were staged on the gravel pad area located west of the NDA. These containers were then moved to the area located south of the NDA. The roll-off containers were tarped to prevent the infiltration of precipitation, and the rear gate was lined with a rubber gasket to prevent the discharge of soil or liquids to the pad surface. The soils in these containers were generated during the installation of the NDA interceptor trench, which was completed in 1990. The soils had the potential to be contaminated with TBP and n-dodecane. The soils were radiologically screened during excavation activities and then staged in this area or other areas based on the results of the screening. The majority of soils staged in the trench soil container area have been disposed off site. Several roll-off containers of LLW remain in the unit. In addition, the CFMT, MFHT, and the Melter (i.e., LLW), which were removed during dismantlement of the vitrification treatment unit have been staged in the western portion of this SWMU (near the railroad tracks) pending off-site disposition.

5.7.2 Wastes Managed at SWMU #31

The soils generated during the trench excavation activities potentially contained TBP, n-dodecane, and radiological constituents.

5.7.3 Investigations and Findings

The results of the SWMU review were summarized in a document entitled *Preliminary Review for NDA Trench Soil Container Area, SWMU #31* (WVNSCO, June 1994) which was submitted to NYSDEC and EPA for review. The report indicated the soils generated during the trench excavation activities were characterized as nonhazardous based on analytical data of soil samples collected during excavation activities, indicating constituent concentrations below regulatory levels, as well as analytical data of trench groundwater.

5.7.4 Conclusions and Recommendations

The WVDP submitted a PR Report to the Agencies for review. In an August 26, 1997 correspondence (Appendix A) from the Agencies, NYSDEC and EPA stated "… a determination of no further action is made for SWMU #31 – NDA Trench Soil Container Area" based on the results of the Preliminary Review.

Based on the location of the NDA Trench Soil Container Area outside of the NDA proper; soil analytical results below regulatory action levels; agencies' concurrence with the PR Report; a determination of "no further action" was made by the Agencies. Given this determination, RCRA Corrective Action should be considered complete for SWMU #31.

5.8 SWMU #32: Old Sewage Treatment Facility

5.8.1 Description and Operational History

The Old Sewage Treatment Facility was located approximately 25 ft (7.6 m) south of the water cooling towers near the Process Building on the North Plateau. This treatment facility provided primary and secondary treatment of sanitary wastewater generated at the WVDP. The unit consisted of a concrete basin, approximately 10 ft (3 m) by 20 ft (6 m) by 10 ft (3 m) in depth constructed with a capacity of 5,000 gpd. The facility consisted of control boxes, a surge tank, an aeration tank, and a clarifier. The Old Sewage Treatment Facility functioned as a sanitary wastewater treatment facility from 1966 to 1985. The effluent from the facility was monitored since 1978 as part of the SPDES regulatory program. The treatment plant received wastewater from the Main Plant locker room floor drains, sinks and toilets, and other on-site sanitary waste streams. The treatment plant was taken out of service in 1985. Discharge lines were removed and influent lines were capped to prevent flow to and from the plant. Some miscellaneous piping, the control boxes, and the concrete basins remain in place. No industrial wastewater was routed to the treatment facility; however, low levels of radioactivity were documented in this facility. A potential piping source was identified, pipes were replaced, and the radioactivity occurrences were eliminated.

5.8.2 Wastes Managed at SWMU #32

The Old Sewage Treatment Facility was a primary and secondary treatment facility for sanitary wastewater generated at the site. Settling of the solids and biological treatment of the wastewater occurred at this facility. Some neutralization, using lime, occurred on rare occasions to maintain the pH of the effluent for SPDES purposes. The facility was a SPDES-permitted facility.

5.8.3 Investigations and Findings

There has been no suspected or documented evidence of releases or spills of hazardous waste or hazardous constituents from the treatment facility. In addition, there is no documented evidence of hazardous waste or hazardous constituents being present in wastewaters treated by the facility in this treatment system. Sludge removed from the basin was radiologically contaminated as a result of inadvertent contamination, which occurred in the late 1970s, and then subsequently addressed by the replacement of process piping.

5.8.4 Conclusions and Recommendations

Based on no documented evidence of hazardous waste or hazardous constituents being present in wastewaters treated by the facility; no documented releases or spills; results of the PR Report (WVNSCO, June 1994); and agency concurrence with the PR Report (October 20, 1994, Appendix A), a determination of “no further action” was made by the regulatory agencies. Given this determination, RCRA Corrective action should be considered complete for SWMU #32.

5.9 SWMU #33: Existing Sewage Treatment Facility

5.9.1 Description and Operational History

The Existing Sewage Treatment Facility was constructed in 1984-1985 south of the Process Building and east of Warehouse I on the North Plateau. This treatment facility provides biological treatment for an average of 10,000 gallons per day (37,850 liters per day) of sanitary wastewater generated at the WVDP. Following biological treatment, the effluent is disinfected by chlorination prior to discharge. The treatment facility consists of six grinder stations, a 25,000-gal (94,625-L) aeration tank, a 10,000-gal (37,850-L) clarifier, and a baffled tank for chlorination and dechlorination. The existing treatment facility was brought into service in 1985 to replace the Old Sewage Treatment Plant. Since 1985, the treatment facility has continually operated to treat sanitary wastewaters generated at the WVDP.

In 1994 the facility was upgraded to handle non-radiological wastewater treatment, such as Utility Room effluent, at rates of 15,000 to 40,000 gallons per day. The facility is now classified as a Wastewater Treatment Facility because it handles sanitary and industrial wastewater and operates continuously.

5.9.2 Wastes Managed at SWMU #33

The Existing Sewage Treatment Facility manages sanitary sewage from all restrooms, sinks and showers at the WVDP and small quantities of non-hazardous laboratory wastewater from the Environmental Laboratory. No floor drains from the Process Building were ever routed to the facility. The SPDES Permit application itemizes the acceptable waste streams to be managed in the system. As mentioned above the system started treating Utility Room wastewater in addition to sanitary wastes after the 1994 expansion. Utility Room effluents include boiler room blowdown, demineralizer regeneration, clarifier sludge blowdown, water softener regeneration solutions and sand filter backwash. The MSDSs for the water conditioning chemicals used in the Utility Room do not indicate the presence of any RCRA hazardous constituents and the effluents are not characterized as RCRA hazardous wastes.

The Existing Sewage Treatment Facility generates a waste sludge during the wastewater treatment process. The sludge accumulates in the clarifier and is pumped to the sludge/surge tank. Periodically some of the sludge is added to the aeration tank to rejuvenate the bacteria contained in it.

5.9.3 Investigations and Findings

There have been no suspected or documented evidence of releases or spills of hazardous waste or hazardous constituents from the treatment facility. In addition, there is no documented evidence of hazardous waste or hazardous constituents being present in wastewaters treated by the facility. MSDSs for water conditioner chemicals used in the utility room do not indicate the presence of any hazardous constituents.

5.9.4 Conclusions and Recommendations

Based on no documented evidence of hazardous waste or hazardous constituents being present in wastewaters treated by the facility; no documented releases or spills; results of the PR Report (WVNSCO, June 1994); and agency concurrence with the PR Report (October 20, 1994, Appendix A), “a determination of no further action” for this SWMU was made by the regulatory agencies. Given this determination, RCRA Corrective Action should be considered complete for the Existing Sewage Treatment Facility. Closure of this unit is subject to the SPDES requirements of 6 NYCRR §750-2.11.

5.10 SWMU #34: Storage Locations for Well Purge Water

5.10.1 Description and Operational History

The well purge water storage locations originally consisted of four, but now consist of two 55-gal (208-L) steel drums with 52-gal (197-L) poly liners used for the accumulation of well purge water. The drums are located on the North Plateau during sampling events, in addition to a polyethylene tank which is used for the collection of purged groundwater during sampling events. Purge waters generated from selected monitoring wells during sampling events have been collected since 1989. This will continue until waste characterization is completed based on laboratory analytical results. The purge waters are managed in accordance with the characterization information. The drums are kept closed when not in use, and drummed contents are managed appropriately based on the most recent purge water/groundwater characterization data.

5.10.2 Wastes Managed at SWMU #34

No hazardous wastes are managed at the well purge water locations and none of the purge water has ever been characterized as hazardous. The purge water is characterized after each sampling event. After characterization the accumulated purge water is disposed of appropriately.

5.10.3 Investigations and Findings

Although low levels of hazardous constituents have been detected in some monitoring wells, none of the purge water has been characterized as hazardous waste. Since groundwater quality may vary over time, the monitoring and characterization data is reviewed on a quarterly basis. In addition, no releases have been associated with the accumulated well purge water since 1989. The groundwater monitoring program will continue until all applicable regulatory requirements have been satisfied.

5.10.4 Conclusions and Recommendations

Based on documented analytical data indicating purge waters are nonhazardous; no documented releases or spills; results of the PR Report (WVNSCO, June 1994); and agency concurrence with the PR Report (October 20, 1994, Appendix A), "a determination of no further action" for this SWMU was made by the regulatory agencies. Given this determination, RCRA Corrective Action should be considered complete for SWMU #34.

5.11 SWMU #35: Construction and Demolition Area

5.11.1 Description and Operational History

This 25 by 25 ft, shallow ground depression area was located southwest of the RHWF approximately 300 ft west of the STS building. It is not an engineer-designed facility, but did undergo minor manipulation (i.e. internal slopes and soil berms) to distinguish it from adjacent facilities.

Concrete materials were deposited in this area from the "cleanout" (residual concrete) of concrete mixing trucks. Concrete from off-site source concrete mixing trucks was used for general WVDP construction at different locations - vitrification cell construction being the primary application. Hence, this area is also known as the Concrete Washdown Area. The concrete washout material was staged in this area until it became set and then was placed in the adjacent dumpster for off-site disposal. The facility has been used solely for this purpose from 1990 to June 1994.

The Construction and Demolition Area was not used for waste treatment other than the "hardening" of the washed out concrete over time prior to the disposal via the adjacent dumpster. Residual concrete is the only waste that was managed in this area.

5.11.2 Wastes Managed at SWMU #35

There has been no anecdotal or documented evidence of deposition of waste(s) at the Concrete Washout Area other than the aforementioned residual concrete rinsed from concrete mixing trucks. Basically innocuous in nature, concrete is made up of water, sand, gravel, cement, and cement additives. MSDSs of Portland cement and the concrete additives do not list any RCRA-regulated hazardous constituents as per 40 CFR Part 261, Appendix VIII. The physical form of the Construction and Demolition Area (berms and slopes) provided containment for the residual concrete wastes. Residence time was made sufficient for hardening to take place followed by placement in adjacent dumpster and eventual offsite disposal. Monthly WVDP spill records and annual unusual occurrence reports contain no reference to the Construction and Demolition Area.

5.11.3 Investigations and Findings

There has not been any environmental monitoring conducted uniquely specific to address the activities conducted at the Construction and Demolition Area. Site-wide 1993/1994 RFI data was collected that gave no cause to pursue focused investigation. Subsequently, there has been and continues to be, an extensive DOE-directed environmental monitoring program for the WVDP that addresses all activities.

5.11.4 Conclusions and Recommendations

The *Preliminary Review for Concrete Washdown Area, SWMU #35* (WVNSCO, June 1994) concluded that no further investigation of the Construction and Demolition Area was necessary for this unit and that there has been no release of RCRA hazardous wastes or hazardous constituents from this unit. Based on review of the PR Report, the NYSDEC-conducted a Visual Site Inspection and evaluation of RFI data, the USEPA and the NYSDEC made "A determination of no further action (NFA) has been made…" in a letter to DOE dated October 20, 1994 (Appendix A). Therefore, RCRA Corrective Action should be considered complete for SWMU #35.

5.12 SWMU #36: Old Schoolhouse Septic System

5.12.1 Description and Operational History

The Old Schoolhouse Septic System is associated with a 25-ft (7.6-m) by 45-ft 13.7-m), two-story building located on the east side of Rock Springs Road, approximately 1 mile (1.6 km) south of the WVDP. Surrounding the building is a small gravel parking lot and vacant, undeveloped fields. A septic system, including a concrete tank and distribution box, is in place at this building to treat domestic sewage and sink drain waste. The building served as a schoolhouse prior to 1960. From the mid-1960s to 1983, NFS (mid-1960s to 1972) and WVDP (1981 to 1983) used the building as an environmental laboratory to perform environmental testing. Bioassay testing was also performed in this building from the mid-1960s until 1972. The environmental testing included pH, specific conductance, gross alpha, gross beta, gamma spectroscopy counting and whole body counting. After 1983, the building has been used for offices, a classroom/training facility, and most recently as a deer check facility during the fall WNYNSC deer-hunting season administered by NYSERDA.

5.12.2 Wastes Managed at SWMU #36

Sanitary waste and sink drain waste is the primary effluent discharged to the Old Schoolhouse Septic System. The identification and quantity of wastes that may have been discharged to the system when bioassays and environmental testing was performed at this facility is unknown. Analytical results from sediment/sludge samples taken from the septic system distribution box indicate limited detections of chemical constituents. There were no detections of hazardous constituents above regulatory limits.

5.12.3 Investigations and Findings

In 1994, an RFA was performed that included an evaluation of past operations and analytical testing of sediment/sludge from the septic system's distribution box. Analytical data of the sediment/sludge sample were reported below regulatory soil guidance levels. The review of past operations concluded that the only known wastes managed through the septic system were domestic sewage and typical sink drain waste.

5.12.4 Conclusions and Recommendations

Based on results of the RFA Report (WVNSCO, December 1994); current use of the unit and agency concurrence with the RFA Report (February 1, 1995, Appendix A), "a determination of no further action" for this SWMU was made by the regulatory agencies. Given this determination, RCRA Corrective Action shall be considered complete for this SWMU.

5.13 SWMU #37: Contact Size-Reduction Facility (CSRF)

5.13.1 Description and Operational History

The CSRF is located in the northeast corner of the Main Plant at ground level and is an enclosed structure constructed of concrete block. The facility was formerly part of the Master Slave Manipulator repair shop that was refurbished and expanded to house the CSRF. The facility is divided into four workrooms (cutting room, decontamination and survey room, small item decontamination room and large item survey and decontamination room), and two personnel airlock entry airlock rooms and one equipment air lock room. The cutting room, the large item decontamination area and a portion of the survey area are approximately 26 ft. by 35 ft. with a height of 18 ft. The remainder of the area is approximately 15 ft. by 35 ft. by 18 ft. high.

Prior to the setup of the CSRF and lining the floors, the floor drains in the entire facility were plugged. The floors, walls, and ceilings in the cutting room and large item decontamination room were lined with stainless steel. The remaining rooms are not lined except during operations when the floors and walls are covered with herculite. The ground surface around the CSRF is sloped away from the building to direct water away from the facility.

The CSRF is used primarily for volume reduction of non-hazardous metallic LLW. In addition it may be used for staging, sampling, sorting, sorting, consolidation, and repackaging mixed waste and LLW containers. CSRF operations began in 1987.

Radiologically-contaminated tanks, vehicles, demolition debris, and other wastes were managed in the CSRF. Non-metallic wastes included vehicle coolant, brake and transmission fluids, and gasoline and diesel fuels. Historical decontamination activities utilized liquid abrasive or water spray procedures. The decontamination waters were collected, filtered, and managed appropriately. Decontamination is now performed by wiping waste surfaces using commercial and/or biodegradable cleaners. In June 2001, the WVDP submitted a modification to the RCRA Part A Permit application that included the addition of the CSRF as a mixed waste storage unit. Accordingly, this unit has been operated in accordance with the hazardous waste management regulations of 6 NYCRR §373.

5.13.2 Wastes Managed at SWMU #37

Wastes managed in the MSM decontamination room prior to the construction of the CSRF include sludge from the old low-level waste treatment facility and radiologically contaminated wastewater from manipulator decontamination. These wastes have been characterized as RCRA non-hazardous.

Wastes managed as a result of operations at the CSRF include radiologically contaminated stainless steel and metal wastes associated with process vessels, piping, tanks, vehicle bodies, frame steel, typical motor vehicle liquids (i.e., ethylene glycol coolants, motor oil, fuels and hydraulic fluids). Each waste (i.e., LLW or mixed LLW) was characterized individually.

5.13.3 Investigations and Findings

Based on the containment integrity of the CSRF provided by the stainless-steel liner and the fact that there are no documented spills or releases of hazardous waste or hazardous constituents from this unit to the environment, no further action was recommended in the PR Report (WVNSCO, June 1994). In addition, subsequent groundwater analytical data from the RFI associated with the Process Building did not indicate the presence of a release from this unit. Continuing groundwater monitoring in the area of the CSRF has not given any indication of a release of hazardous wastes or constituents from the CSRF.

5.13.4 Conclusions and Recommendations

The PR Report and the recommendation of no further action were subsequently approved by the agency (January 29, 1998, Appendix A). Additionally, the CSRF is subject to RCRA closure under Interim Status or Final Status Standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively, as applicable of the time of RCRA closure. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #37.

5.14 SWMU #38: Drum Super Compactor

5.14.1 Description and Operational History

A supercompactor, installed in 1987, was used to reduce the volume of low level, radiologically contaminated, compressible items until 1992. It was housed in a prefabricated trailer to the southwest side of the LSB (SWMU #15), within the LLWSA. The LSB is located about 400 ft northeast of the Process Building. An air lock connection was used to move containers of compacted material between the LSB and supercompactor. To provide containment and prevent airborne or spillage contamination, the construction of the supercompactor included walls lined with herculite, flooring lined with rubber matting, and a dedicated high-efficiency particulate air filter. The supercompactor was shipped to the DOE's Savannah River Site on May 14, 1998 as outlined in DOE's May 29, 1998 correspondence (Appendix B) to EPA and the NYSDEC. The unit was no longer being used at the WVDP and was made available for use at the DOE Savannah River Site.

In conjunction with RFI work efforts, SWMU #38 was identified as a new SWMU in an April 7, 1993 correspondence by the DOE to the NYSDEC and EPA. Accordingly, this area was the object of a RCRA Facility Investigation the results with the results documented in *Resource Conservation and Recovery Act Facility Investigation Report, Low-level Waste Storage Area*, (WVNSCO, October 1996).

5.14.2 Wastes Managed at SWMU #38

It was determined in the RFI that a PCB spill, occurring sometime between December 1989 and November 1990 within the compactor, was not released to the environment based on the secondary containment features of the unit and the 1993/1994 sampling and analytical non-detectable results for PCBs in downgradient groundwater monitoring wells. The off-site relocation of the super compactor has precluded a release of any regulated RCRA waste or any RCRA-regulated hazardous constituents from this SWMU at the WVDP subsequent to the May 1998 relocation date.

5.14.3 Investigations and Findings

The *Resource Conservation and Recovery Act Facility Investigation Report, Low-level Waste Storage Area*, (WVNSCO, October 1996) recommended a no further action status for SWMU #38. The groundwater data collected during RFI and post-RFI activities for this unit (see Section 5.6.3) has not indicated that a release of hazardous waste or hazardous waste constituents from this SWMU has occurred.

5.14.4 Conclusions and Recommendations

Final (approved) copy of the RFI Report (WVNSCO, October 1996) which addressed SWMU #38 was transmitted by DOE to EPA and the NYSDEC. The conclusion of no further action necessary was concurred with by the Agencies in their July 30, 1996 correspondence (Appendix A). Given the relocation of the super compactor as described above and it no longer being used at the WVDP, RCRA Corrective Action should be considered complete for SWMU #38.

5.15 SWMU #39: Staging Area for the NDA

5.15.1 Description and Operational History

The Staging Area for the NDA (also known as the NDA Hardstand), which is associated with SWMU #2, is located outside the southeast corner of the NDA. It is a three-sided, cinder block-walled unit with a gravel pad. There are no known operating records for the NDA staging area. Radioactive solid waste was disposed at the NDA by NFS from 1966 to 1982 and by the WVDP from 1982 to 1986. The cinder block walls were used for shielding purposes. Lead shielding used during burial operations was staged in this location until 1989. This area is no longer used for waste management activities.

5.15.2 Wastes Managed at SWMU #39

Historically, the materials disposed in the NDA were categorized according to the radioactivity of the waste. NFS' disposal of radioactive solid waste generated during nuclear fuel reprocessing operations included fuel hulls, general waste such as radioactively contaminated clothing and equipment, fuel canisters, ruptured fuel assemblies encased in concrete, and spent ion-exchange resins and diatomaceous filter media. Some of this material had high radioactive dose rates. The LLW disposed during WVDP's operations included radiologically contaminated Process Building equipment and waste (i.e., plastics, wood, rubber, metal, paper), protective clothing, contaminated soils, and other similar types of waste that were generated while maintaining the main process building in a safe shutdown condition.

5.15.3 Investigations and Findings

The analytical results of the two surface soil samples collected in December 1993 during RFI activities indicated that RCRA hazardous constituents detected in environmental samples were below TAGM 4046 soil cleanup levels. In addition, pre-RFI and RFI groundwater sampling data generated from 1991 through 1994 for the underlying weathered Lavery till and the Kent recessional sequence do not indicate the exceedance of TOGS 1.1.1 groundwater quality criteria or site background concentrations (See Section 4.9.3.2).

5.15.4 Conclusions and Recommendations

The RFI report was submitted by DOE to NYSDEC and EPA in March 1995. Upon review of this document, a NYSDEC and EPA correspondence dated January 24, 1996 (Appendix A) recommended that "no further action is acceptable for the short term" and that this recommendation "…may not be acceptable for the long-term." Subsequent to this correspondence, the WVDP submitted additional waste disposal information to the Agencies per their request. In a July 23, 1996 (Appendix A) correspondence from the Agencies, NYSDEC and EPA agreed "…that no action will be required for the following SWMUs: 1. NDA Hardstand…"

Based on the location of the NDA staging area outside of the NDA proper; the analytical results from RFI and post-RFI sampling activities indicating the presence of RCRA hazardous constituents below action levels; agencies' concurrence with the RFI Report; a determination of "no further action" was made by the Agencies. Given this determination, RCRA corrective action should be considered complete for SWMU #39.

5.16 SWMU #40: Satellite Accumulation Areas (SAAs) and 90-day Storage Areas

5.16.1 Description and Operational History

As of September 30, 2004, the SAAs and 90-day storage areas are currently composed of eight active SAAs and two 90-day storage areas (one of which is identified as SWMU #43) (Appendix C). The locations of the current areas are identified on Figure 1-1. The locations of these areas change periodically due to their nature as temporary collection points located near the source of waste generation. By definition, SAAs are areas for short-term accumulation of hazardous and mixed wastes under direct control of the operator at or near the point of initial generation. The SAAs are managed in accordance with SOP 300-04 and RCRA regulations, which limit accumulation at the point of generation to 55 gal (208 L) of waste or 0.26 gal (1 L) of acute hazardous waste. Once the RCRA waste accumulation limit is neared or met, the container is transported to an appropriate on-site storage facility. The 90-day storage areas involve the temporary storage of hazardous or mixed wastes in containers or tanks. These areas are managed in accordance with ECS-345, *90-Day Storage Area Requirements for Tanks and Containers*, and 6 NYCRR §373-1.1(d)(1)(iii) and wastes must be relocated to permitted storage areas or shipped off site within 90 days of their generation.

5.16.2 Wastes Managed at SWMU #40

Given the temporary nature of SAAs (i.e. temporary location, waste types, and the total number of SAAs), the wastes managed in the SAAs varies greatly over time. Typical wastes contained at SAAs have been hazardous or mixed wastes such as ammonia, developer solution, radiologically contaminated organic waste, acidic waste generated from laboratory analysis for metals, chromium waste, and fluorescent light bulbs. The SAAs are tracked with a database spreadsheet managed by the waste management department.

5.16.3 Investigations and Findings

There have been no historical records of spills or releases in the SAAs or the 90-day storage areas. Containers are labeled and tracked for inventory purposes. Due to the periodic use and closure of SAAs and 90-day areas, several waste streams have been managed historically.

A preliminary review of this SWMU was performed by evaluating the historical use of the areas, waste characterization data and the records of potential releases/remediation. The results of the SWMU review were summarized in a document entitled *Preliminary Review for Satellite Accumulation Area (SAA), SWMU #40* (WVNSCO, June 1994) which was submitted to NYSDEC and EPA for review. The report concluded that since these areas were actively tracked, maintained, and inspected, there would be no reason to suspect that a release from these areas would adversely impact the environment.

5.16.4 Conclusions and Recommendations

Based on the fact that there have been no documented spills or releases in SAAs or 90-day storage areas; the active monitoring, maintenance, and inspections performed in accordance with SOP 300-04 and RCRA regulations; results of the PR Report; and agency concurrence with the PR Report (November 21, 1994, Appendix A), a determination of “no further action” was made by the Agencies. Given this determination, RCRA corrective action should be considered complete for SWMU #40.

5.17 SWMU #41 Designated Roadways

5.17.1 Description and Operational History

This SWMU consists of approximately 0.7 mi (1.1 km) of former dirt roadways on the WVDP that were sprayed with used oils generated in the maintenance shop on a semiannual basis to suppress dust on heavily traveled areas between 1970 and 1980. The roadways are those located between the Electrical Substation on the northeast corner of the WVDP and the Maintenance Shop and also between the Warehouse and the NDA,

The used oils and associated residual waste (i.e. grit, solvent residues, and parts washing station solvent waste) were accumulated in drums before application for dust mitigation. Approximately three to six of these 50-gal drums were applied to the roadways once or twice a year. This management practice was discontinued in 1980 when an off-site commercial waste oil hauler began collecting the used oil for recycling purposes.

In conjunction with RFI work efforts, SWMU #41 was identified as a new SWMU in a January 3, 1994 correspondence from the DOE to the NYSDEC and EPA. Therefore, this area was the object of a preliminary review in which the historical use of the area, waste characterization data, and the records of potential releases/remediation were evaluated. The results of the preliminary review are summarized in a document titled *Preliminary Review for Designated Roadways, SWMU #41* (WVNSCO, June 1994) which was submitted by DOE to the NYSDEC and EPA in a June 20, 1994 correspondence.

5.17.2 Wastes Managed at SWMU #41

The used oil and associated materials were dispensed on to the roadways with a sprayer mounted on the rear of a truck. This dust mitigation practice ended in 1980. The roadways have all been paved with asphalt since the WVDP came under operational control of the DOE in 1982. The used oil may have been from the use of contemporary Getty Oil Products such as Turbine Oil, Atirbrio 50, 60, 70, and machine oil. Varsol Solvent and PolyChem were solvents used for parts cleaning. Varsol was mineral spirits, while PolyChem was a mixture of aliphatic hydrocarbons (60-75%), perchloroethylene (10-30%), and methylene chloride (1-10%). Methylene chloride and perchloroethylene are both RCRA hazardous constituents.

5.17.3 Investigations and Findings

The 1993 RFI soils investigation included several surface and shallow surface sampling locations for organics and metals analyses. Soil analytical data was compared to NYSDEC's TAGM 4046 soil cleanup criteria for detections of hazardous constituents. One VOC, carbon disulfide, was estimated detected at 2.1 micrograms per kilogram (µg/kg) in borehole (BH)-35 at the 6-8' depth. This concentration was below its respective TAGM 4046 soil cleanup standard. The SVOC, di-n-butyl phthalate was detected at estimated values of 288.4 milligrams per kilogram in BH-23 at the 8-10' depth and fluoranthene was detected at an estimated concentration of 52.9 µg/kg in surface soil sample SS-18R. Both concentrations were reported below TAGM 4046 clean-up objectives.

No RCRA hazardous constituent metals were detected above established WVDP background concentrations.

5.17.4 Conclusions and Recommendations

In the February 13, 1995 DOE correspondence to EPA and the NYDEC, it was indicated that the activities at SWMU #41 do not appear to have impacted the surrounding environmental area and therefore no further action is recommended. As documented in a March 9, 1998 letter (Appendix A) from NYSDEC and EPA to DOE, Agency evaluation of the *Preliminary Review for Designated Roadways, SWMU #41* (WVNSCO, June 1994), including RFI soils data, concluded that "There are no identifiable environmental impacts from past activities in the Designated Roadways." In addition, the Agencies made "…a determination of no further action…" for this SWMU. Therefore, RCRA Corrective Action should be considered complete for this SWMU #41.

5.18 SWMU #42: Product Storage Area

5.18.1 Description and Operational History

The Product Storage Area was an open-air storage area consisting of an asphalt pad approximately 20 ft (6.1 m) by 60 ft (18.3 m) in size located in the southeastern portion of the North Plateau, adjacent to the southern end of the Warehouse I. The area is generally flat with little surface runoff, and had been previously enclosed by a perimeter fence.

5.18.2 Wastes Managed at SWMU #42

Until mid-1985, the area was used for the staging of containerized raw materials, including lubricating oils, degreasers, TBP, and n-dodecane.

5.18.3 Investigations and Findings

There have been no documented spills or releases in this area. A formal site inspection was conducted with an on-site NYSDEC coordinator on November 8, 1994. During this inspection, no signs of discharge, such as asphalt or soil discoloration, were evident. This also included the collection of five soil samples. The analytical results of the samples did not indicate the detection of any VOC or SVOC hazardous constituents in the soil underlying surficial asphalt. Metals detected were consistent with background concentrations and/or were reported below regulatory action levels.

5.18.4 Conclusions and Recommendations

Based on the analytical results of soil sampling; the current use of the area; results of the site inspection and RFA Report (WVNSCO, May 1995); and agency concurrence with the RFA Report (December 16, 1996, Appendix A), a determination of "no further action" was made by the Agencies. Given this determination, RCRA corrective action should be considered complete for SWMU #42.

5.19 SWMU #43: Warehouse Extension Staging Area

5.19.1 Description and Operational History

The Warehouse Extension Staging Area is an indoor storage area with a concrete floor measuring approximately 50 ft (15.2 m) by 80 ft (24.4 m) in the southern end of Warehouse II. Two sides of the staging area are bermed. The staging area became operational in 1991 with the temporary storage of wastes. This area is used as a 90-day storage area for industrial wastes, hazardous wastes and materials, and universal waste lamps, batteries, and recyclables. This area also functions as a supply area for both Hazardous Waste Operations and the former Hazardous Materials Response Team.

5.19.2 Wastes Managed at SWMU #43

All materials managed in the Waste Management Staging Area are industrial wastes (e.g. asbestos contaminated material, concrete, absorbents for petroleum spills), universal wastes, lead-acid batteries, fluorescent light bulbs, or recyclable materials.

5.19.3 Investigations and Findings

There have been no historical records of spills or releases in this staging area. Weekly and monthly inspections are performed when the 90-day storage area is active. Containers are labeled, weighed, and tracked for inventory purposes. Due to the nature of this unit, numerous nonhazardous wastes that are managed in this area; however, they may contain hazardous constituents.

A preliminary review of this SWMU was performed by evaluating the historical use of the area, waste characterization data, and the records of potential releases/remediation. The results of the SWMU review were summarized in a document titled *Preliminary Review of Warehouse Extension Waste Management Staging Area, SWMU #43* (WVNSCO, June 1994), which was submitted to NYSDEC and EPA for review. The preliminary review concluded that since there are no known or suspected releases of hazardous waste or hazardous constituents and the unit is actively monitored, maintained, and inspected.

5.19.4 Conclusions and Recommendations

Based on the fact that there have been no documented spills or releases in this staging area; results of the December 1993 visual inspection; the active monitoring, maintenance, and inspections performed; results of the PR Report; and agency concurrence with the PR Report (November 21, 1994, Appendix A), a determination of "no further action" was made by the Agencies. Given this determination, RCRA corrective action should be considered complete for SWMU #43.

5.20 SWMU #44: Fuel Receiving and Storage Area HIC and SUREPAK™ Staging Area

5.20.1 Description and Operational History

The High-Integrity Container (HIC) Storage Area is located north of the FRS and consists of a gravel pad where the containers are staged. The HIC Storage Area is used to store overpacked containers containing spent filter media from the FRS wastewater treatment unit. The radioactive and/or mixed waste is packaged in the Hittman Building and then placed on the gravel pad north of the Hittman Building. In September 1995, the WVDP submitted a modification to the RCRA Part A Permit application that included the addition of the HIC Storage Area gravel pad as a mixed waste storage unit. Accordingly, this unit has been operated in accordance with the hazardous waste management regulations of 6 NYCRR §373. In addition, closure of this unit will be performed pursuant to regulatory requirements of 6 NYCRR §373-3.7. As of September 2004, there were five HICs containing radioactive waste and one HIC containing mixed waste staged in this area.

5.20.2 Wastes Managed at SWMU #44

LLW and mixed LLW containing chromium have been the only wastes managed in this unit.

5.20.3 Investigations and Findings

There have been no historical records of spills or releases in this container storage area. Radiological surveys are performed weekly for the Hittman Building, and monthly for the storage area. Additionally, the storage area is inspected weekly for signs of container deterioration and leaks. Based on the activities performed in the FRS, chromium is the only hazardous waste/hazardous constituent potentially present in the mixed waste HIC. The PR Report concluded that no further actions are necessary for this unit based on no reported releases, the HIC and SUREPAK™ containers providing primary and secondary containment, no additional hazardous waste to be generated, and the disposition of the generated mixed waste addressed.

5.20.4 Conclusions and Recommendations

The PR Report (WVNSCO, July 1995) and the recommendation of no further action were subsequently approved by the agency (December 15, 1997, Appendix A). Additionally, the HIC Storage Area is subject to RCRA closure under Interim Status Standards pursuant to 6 NYCRR §373-3.7, as applicable at the time of RCRA closure. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #44.

5.21 SWMU #45: Breach in Laundry Wastewater Line

5.21.1 Description and Operational History

As a result of a sewer line inspection requested by the NYSDEC Division of Water, a breach was discovered in a 3-inch-diameter (7.6-cm) sewer line used to convey wastewater from the WVDP's laundry operations to the LLWTF on the North Plateau. Based on the inspection, the breach appeared roughly elliptical in shape and was estimated to be approximately 2 inches (5.1 cm) long and 1.5 inches (3.8 cm) wide. The breach was located approximately 8 ft (2.4 m) to 10 ft (3.1 m) below grade. The sewer line was installed in 1986 and has conveyed discharges from the laundry operations since 1995. Two source areas were historically connected to the breached drain line; a floor drain in the UWA airlock and a steam condensate drain from the Product Packaging and Shipping area. The UWA airlock floor drain was disconnected in May 2002. The Product Packaging and Shipping drain line was utilized from 1997 to 2000. The breach in the process sewer line was confirmed on October 20, 2003; however, the exact timing of the breach is unknown. The effluent discharge from the laundry has been redirected into an intact sewer line that discharges to the LLWTF.

5.21.2 Wastes Managed at SWMU #45

The laundry operation is surfactant-based and does not include the use of organic solvents. There are no known instances of hazardous or mixed waste disposal through the breached line.

5.21.3 Investigations and Findings

During RFI activities, there were no indications that RCRA hazardous waste or hazardous constituents were discharged from the UWA airlock. As for the Product Packaging and Shipping area, there were minimal flows and it is anticipated that RCRA hazardous constituents have not been present. Video inspection activities were initiated for WVDP process sewers in October 2003. Samples of wastewater from the laundry were analyzed on two occasions for radiological and chemical parameters. Analytical data indicate that RCRA constituent concentrations were below regulatory levels.

5.21.4 Conclusions and Recommendations

Soil samples were collected on September 24, 2004 and submitted for laboratory analysis, based on a NYSDEC request for the collection of representative soil samples to assess the sewer line breach. Laboratory results and conclusions and recommendations will be submitted to NYSDEC upon receipt and evaluation.

5.22 SWMU #46: Vitrification Vault and Empty Container Hardstand

5.22.1 Description and Operational History

SWMU #24 consists of a graveled area west of the HWSLs where four pre-fabricated concrete vaults have been constructed to contain low-level and remote-handled TRU wastes generated during D&D of the VF and the Process Building. The wastes stored in this unit may be staged on the gravel hardstand or may be placed in shielded containers before being staged in the vaults. This gravel pad is large enough to accommodate additional concrete vaults. Generally, the vaults are expected to have interior dimensions of 16.5 ft (5 m) by 63 ft (19.2 m) by 5.7 ft (1.7 m) high, and the concrete vault walls, floor, and cover are a minimum of 14 inches (36 cm) thick, but may vary based on shielding and waste stream requirements.

This unit has been primarily used as an empty container storage area and nuclear criticality staging area for solid (physical-state) wastes removed from the Process Building during D&D activities. TRU wastes from other D&D activities are temporarily staged in this area until all nuclear safety data has been obtained and reviewed. Upon approval of waste acceptance criteria, the containers are then relocated to appropriate on-site storage facilities. In addition, the HLW tank mobilization pumps are stored in concrete vaults with this unit.

5.22.2 Wastes Managed at SWMU #46

During D&D activities where RCRA mixed wastes were identified, a temporary 90-day storage area was established until the nuclear criticality safety requirements were reviewed. The mixed waste containers were then relocated to on-site permitted storage facilities. The mixed waste containers were managed in the 90-day area for criticality evaluation purposes. Lead, chromium, and mercury were identified in the mixed waste containers.

5.22.3 Investigations and Findings

No investigations have been performed on this SWMU, as the unit was identified based on its intended use.

5.22.4 Conclusions and Recommendations

This SWMU will be monitored for evidence of releases during the operating life of this radioactive waste storage area.

5.23 SWMU #47: Remote-Handled Waste Facility

5.23.1 Description and Operational History

The RHWF is located northwest of the Process Building on the North Plateau, adjacent to the CPC-WSA. The containment building is a free-standing structure that is approximately 188 ft (57 m) by 91 ft (28 m). The RHWF was designed to meet 6 NYCRR §§373-2.30 and 373-3.30 regulatory requirements for containment buildings. The RHWF became operational as an Interim Status containment building for treatment of radioactive and mixed waste in June 2004 and is currently operating. The unit is being used to size reduce radioactive and mixed wastes associated with D&D activities performed at the WVDP. The RHWF is scheduled to process the mixed waste generated during the D&D of the CPC, which is being managed in the CPC-WSA (SWMU #14).

5.23.2 Wastes Managed at SWMU #47

As stated in Section 4.7.2, the wastes managed in the CPC-WSA that are anticipated to be processed in the RHWF include LLW and mixed LLW waste.

5.23.3 Investigations and Findings

No investigations have been performed on this SWMU, as the unit was constructed in an area of the WVDP that was not impacted by site activities, and began operations in June 2004.

5.23.4 Conclusions and Recommendations

The RHWF is subject to RCRA closure under Interim Status or Final Status Standards pursuant to 6 NYCRR §§373-3.7 or 373-2.7, respectively, as applicable at the time of RCRA closure. It is anticipated that upon meeting RCRA clean closure performance standards, RCRA Corrective Action will be considered complete for SWMU #47.

6.0 ACRONYMS

1,1-DCA	1,1-Dichloroethane
1,2-DCE	1,2-Dichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
6 NYCRR	Title 6 of the Official Compilation of Codes, Rules, and Regulation of the State of New York
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
A&PC	Analytical & Process Chemistry
ARC	Acid Recovery Cell
ARPR	Acid Recovery Pump Room
CDDL	Construction and Demolition Debris Landfill
CFR	Code of Federal Regulations
CFMT	Concentrator Feed Makeup Tank
CM	Centimeter
CPC	Chemical Process Cell
CPC-WSA	Chemical Process Cell – Waste Storage Area
CSRF	Contact Size-Reduction Facility
Cs-137	Cesium-137
CSS	Cement Solidification System
CWA	Clean Water Act
D&D	Decontamination and Decommissioning
DCDFM	Dichlorodifluoromethane
DOE	U.S. Department of Energy
EDTA	Ethylenediaminetetraacetic Acid
EIS	Environmental Impact Statement
EP	Extraction Procedure
EPA	U.S. Environmental Protection Agency
FRS	Fuel receiving and Storage
FT	Feet/Foot
FT^2	Square Feet
FT^3	Cubic Feet
GAL	Gallon
GRIT/STAT	National Groundwater Information Tracking System/STATistical Analysis System
HA	Hectare
HIC	High-Integrity Container
HLW	High-Level Waste
HWSL	Hazardous Waste Storage Locker
IRTS	Integrated Radioactive Waste Treatment System
IWSF	Interim Waste Storage Facility
KG	Kilogram
KM	Kilometer
L	Liter
LDR	Land Disposal Restriction
LLW	Low-Level Waste
LLWSA	Low-Level Waste Storage Area
LLWTF	Low-Level Waste Treatment Facility
LSA	LAG Storage Addition
LSB	LAG Storage Building
LWA	Lower Warm Aisle
LXA	Lower Extraction Aisle
LWTS	Liquid Waste Treatment System

M	Meter
M^3	Cubic Meters
MFHT	Melter Feed Hold Tank
MI	Miles
MSDS	Material Safety Data Sheet
MSLF	Maintenance Shop Leach Field
MSM	Master Slave Manipulator
NDA	NRC-Licensed Disposal Area
NFS	Nuclear Fuel Services, Inc.
NRC	Nuclear Regulatory Commission
NYSERDA	New York State Energy and Research Development Authority
NYSDEC	New York State Department of Environmental Conservation
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PPC	Product Purification Cell
PR	Preliminary Review
PUREX	Plutonium Uranium Reduction Extraction Process
PVC	Polyvinyl Chloride
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RHWF	Remote-Handled Waste Facility
RTS	Radwaste Treatment System
SAA	Satellite Accumulation Area
SBW	Sodium-Bearing Waste
SDA	New York State-Licensed Disposal Area
SMS	Sludge Mobilization System
SOP	Standard Operating Procedure
SPDES	State Pollutant Discharge Elimination System
SRR	Scrap Removal Room
Sr-90	Strontium-90
SST	Solvent Storage Terrace
STS	Supernatant Treatment System
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
SSWMU	Super Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TBP	Tributyl Phosphate
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TEGD	Technical Enforcement Guidance Document
THOREX	Thorium Reduction Extraction
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series
TOX	Total Organic Halogen
TRU	Transuranic
ULO	Uranium Load Out
UNH	Uranyl Nitrite Hexahydrate
UPC	Uranium Product Cell
UWA	Upper Warm Aisle
UXA	Upper Extraction Aisle

VC	Vitrification Cell
VF	Vitrification Facility
VOC	Volatile Organic Compound
WNYNSC	Western New York Nuclear Service Center
WRPA	Waste Reduction and Packaging Area
WVNSCO	West Valley Nuclear Services Company LLC
WVDP	West Valley Demonstration Project
XC	Extraction Cell
XCR	Extraction Chemical Room
YD^3	Cubic Yards

7.0 REFERENCES

Dames & Moore. June 1998. Final Report: Evaluation of the Pilot Program to Investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit. JMM0269:JMM-0.01.

Federal Register. July 1990. 40 CFR Part 261, Identification and Listing of Hazardous Wastes.

__________. July 1990. 40 CFR Part 264 Subparts, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Corrective Action for Solid Waste Management Units.

__________. July 1990. 40 CFR Part 268, Land Disposal Restrictions.

New York State Department of Environmental Conservation. Title 6 New York State Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Part 360-7, Construction and Demolition Debris Landfills.

__________. 6 NYCRR Part 371, Identification and Listing of Hazardous Waste.

__________. 6 NYCRR Part 373-2, Final Status Standards for owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.

__________. 6 NYCRR Part 373-3, Interim Status Standards for owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.

__________. 6 NYCRR Part 376, Land Disposal Restrictions.

__________. 6 NYCRR Part 750-2.11, Closure Requirements for Wastewater Treatment Facilities.

__________. October 28, 1986. Letter. Robert J. Mitrey, P.E. to J.P. Hamric. Closure Plan for the Construction Landfill (WVDP).

__________. March 1992. U.S. EPA Region II Administrative Order on Consent Docket No. II, RCRA 3008(h)-92-0202, Proceedings Under Section 3008 (h) of the RCRA amended.

__________. September 30, 1993. Letter. P.R. Counterman and A. Bellina to R. Provencher. Final Approval of the West Valley Demonstration Project RCRA Facility Investigation (RFI) Work Plan.

__________. January 24, 1994. Revised Division Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels. HWR-94-4046.

__________. October 20, 1994. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. U.S. Department of Energy RCRA Facility Investigation Supplemental Solid Waste Management Units.

__________. November 21, 1994. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. Supplemental SWMUs Preliminary Reviews.

__________. December 12, 1994. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. Sealed Rooms Paper Investigation Report.

__________. January 12, 1995. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. Subcontractor Maintenance Area Resource Conservation and Recovery Act (RCRA) Facility Assessment Report Revisions.

__________. February 1, 1995. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. Resource Conservation and Recovery Act (RCRA) Facility Assessment - SWMU #36 Old Schoolhouse Septic System.

__________. May 22, 1995. Letter. T.I. DiGiulio and A. Bellina to E. A. Matthews. Resource Conservation and Recovery Act (RCRA) Facility Assessment for the Fire Brigade Training Area Solid Waste Management Unit (SWMU) #27.

__________. January 24, 1996. Letter. T.I. DiGiulio and A. Bellina to E.A. Matthews. 3008(h) Order on Consent RCRA Facility Investigation (RFI) Report Review Nuclear Regulatory Commission-Licensed Disposal Area - Volume 2.

__________. July 23, 1996. Letter. T.I. DiGiulio and A. Bellina to E.A. Matthews. 3008(h) Order on Consent Nuclear Regulatory Commission-Licensed Disposal Area (NDA): 1. Listed Hazardous Waste Determination, 2. Piezometer Installation Plan at the NDA, 3. Associated NDA SWMUs.

__________. July 30, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Matthews. 3008(h) Order on Consent RCRA Facility Investigation (RFI) – Report Approval Low-level Waste Storage Area (LLWSA) – Volume 6.

__________. August 27, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Matthews. 3008(h) Order on Consent RCRA Facility Investigation (RFI) Report Review and Comments Construction and Demolition Debris Landfill (CDDL) - Volume 3.

__________. November 4, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) Report Approval, Miscellaneous Small Units (MSU)-Volume 5.

__________. November 22, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) Report Approval – Chemical Process Cell Waste Storage Area – Volume 7.

__________. November 22, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) - Report Approval Low-Level Waste Treatment Facility – Volume 4.

__________. December 16, 1996. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Assessment (RFA) Product Storage Area Solid Waste Management Unit (SWMU).

__________. February 11, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) - Report Approval High-Level Waste Storage and Processing Area – Volume 8.

__________. March 6, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) - Report Approval Liquid Waste Treatment System – Volume 10.

__________. June 16, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. 3008(h) Order on Consent, RCRA Facility Investigation (RFI) - Report Approval Maintenance Shop Leach Field – Volume 9.

__________. July 31, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent [Docket No. II RCRA 3008(h) 92-0202] Supplemental Solid Waste Management Unit (SWMU) #29 – Industrial Waste Storage Area (IWSA).

__________. August 26, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent [Docket No. II RCRA 3008(h) 92-0202] Supplemental Solid Waste Management Unit (SWMU) #31 – NDA Trench Soil Container Area .

__________. December 15, 1997. Letter. T.I. DiGiulio and R. Basso to E.A. Lowes. Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent (Docket No. II RCRA 3008(h) 92-0202) Supplemental Solid Waste Management Unit (SWMU) #44 – Fuel Receiving and Storage Area HIC and Surepak™ Staging Area.

__________. January 22, 1998. Letter. T.I. DiGiulio and J. Reidy to E.A. Lowes. 3008(h) Order on Consent – Sealed Rooms.

__________. January 29, 1998. Letter. T.I. DiGiulio and J. Reidy to E.A. Lowes. Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent (Docket No. II RCRA 3008(h) 92-0202) Supplemental Solid Waste Management Unit (SWMU) #37 – Contact Size Reduction Facility.

__________. March 9, 1998. Letter. T.I. DiGiulio and J. Reidy to E.A. Lowes. Resource Conservation and Recovery Act 3008(h) Administrative Order on Consent (Docket No. II RCRA 3008(h) 92-0202) Supplemental Solid Waste Management Unit (SWMU) #41 – Designated Roadways.

__________. June 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1.

U.S. Congress. October 1, 1980. An Act to Authorize the Department of Energy to Carry Out a High-Level Nuclear Waste Management Demonstration Project at the Western New York Nuclear Service Center in West Valley, New York. Public Law 96-368 (S.2443). Congressional Record, Vol. 126. (Also known as the WVDP Act.)

U.S. Department of Energy. May 29, 1998. Letter. E.A. Lowes to B. Quinn and T.I. DiGiulio. Removal of Solid Waste Management Unit (SWMU) #38, Drum Super Compactor, and Change in RCRA 3008(h) Consent Order Meeting Frequency.

U.S. Environmental Protection Agency. Resource Conservation and Recovery Act of 1976, as amended, 42 USC Sections 6901 to 6992.

__________. September 1986. Groundwater Monitoring Technical Enforcement Guidance Document.

__________. November 1992. GRITS/STAT, version 4.2. A Ground Water Information Tracking System with Statistical Analysis Capability. EPA/625/11-91/002.

West Valley Nuclear Services, Co. LLC. December 1993. West Valley Demonstration Project RCRA Facility Investigation Work Plan. WVDP-RFI-014.

__________. May 1994. RCRA Facility Investigation Report, Volume 1, Introduction and General Site Overview. WVDP-RFI-017.

__________. May 1994. Sealed Rooms Paper Characterization. WVDP-RFI-016.

__________. June 1994. Preliminary Review for Designated Roadways, SWMU #41. RFI:94:0805.

__________. June 1994. Preliminary Review for Vitrification Hardstand Area, SWMU #28. RFI:94:0005.

__________. June 1994. Preliminary Review of Cold Hardstand (SWMU #30). RFI:94:0005.

__________. June 1994. Preliminary Review of Concrete Washdown Area, SWMU #35. RFI:94:0005.

__________. June 1994. Preliminary Review of the Contact Size Reduction Facility (SWMU #37). RFI:94:0005.

__________. June 1994. Preliminary Review of Existing Sewage Treatment Plant/Wastewater Treatment Plant, (SWMU #33). RFI:94:0005.

__________. June 1994. Preliminary Review of Industrial Waste Storage Area (SWMU #29). RFI:94:0005.

__________. June 1994. Preliminary Review of NDA Trench Soil Container Area (SWMU #31). RFI:94:0005.

__________. June 1994. Preliminary Review of Old Sewage Treatment Facility, SWMU #32. RFI:94:0005.

__________. June 1994. Preliminary Review of Satellite Accumulation Areas (SAA) (SWMU #40). RFI:94:0005.

__________. June 1994. Preliminary Review of Warehouse Extension Waste Management Staging Area (SWMU #43). RFI:94:0005.

__________. June 1994. Preliminary Review of Well Purge Water Locations (SWMU #34). RFI:94:0005.

__________. July 1994. Inventories and Descriptions Based on Historical and Process Knowledge Pursuant to Section 7.2.2 of the Federal and State Facility Compliance Agreement (FSFCA), Docket No. II, RCRA-93-0207. (Also referred to as the FSFCA Historical Waste Report).

__________. August 1994. RCRA Facility Assessment of the Subcontractor Maintenance Area (SWMU #26).

__________. December 1994. RCRA Facility Assessment of the Old Schoolhouse Septic System (SWMU #36).

__________. March 1995. Resource Conservation and Recovery Act Facility Assessment of the Fire Brigade Training Area (SWMU #21). RFI:94:0010.

__________. May 1995. RCRA Facility Assessment of the Product Storage Area (SWMU #42).

__________. July 1995. Preliminary Review for Fuel Receiving and Storage Area SUREPAK™ and HIC Staging Area (SWMU #44). RFI:95:0018.

__________. September 1995. Resource Conservation and Recovery Act Facility Investigation Report, Volume 2, Nuclear Regulatory Commission-Licensed Disposal Area. WVDP-RFI-018.

__________. April 1996. Resource Conservation and Recovery Act Facility Investigation Report, Volume 3, Construction and Demolition Debris Landfill. WVDP-RFI-019.

__________. October 1996. Resource Conservation and Recovery Act Facility Investigation Report, Volume 6, Low-Level Waste Storage Area. WVDP-RFI-022.

__________. December 1996. Resource Conservation and Recovery Act Facility Investigation Report, Volume 7, Chemical Process Cell Waste Storage Area. WVDP-RFI-023.

__________. January 1997. Resource Conservation and Recovery Act Facility Investigation Report, Volume 5, Miscellaneous Small Units. WVDP-RFI-020.

__________. January 1997. Resource Conservation and Recovery Act Facility Investigation Report, Volume 4, Low-Level Waste Treatment Facility. WVDP-RFI-021.

__________. April 1997. Resource Conservation and Recovery Act Facility Investigation Report, Volume 8, High-Level Waste Storage and Processing Area. WVDP-RFI-024.

__________. May 1997. Resource Conservation and Recovery Act Facility Investigation Report, Volume 10, Liquid Waste Treatment System. WVDP-RFI-026.

__________. July 1997. Resource Conservation and Recovery Act Facility Investigation Report, Volume 9, Maintenance Shop Leach Field. WVDP-RFI-025.

__________. November 2002. Landfill Inspection and Maintenance. SOP 40-04.

__________. April 2003. Hazardous Waste – Satellite Accumulation Areas. SOP 300-04.

__________. November 2004. Groundwater Monitoring Plan. WVDP-239, Rev. 8.

TABLES

FIGURES

APPENDICES

APPENDIX A

EPA AND NYSDEC SWMU CORRESPONDENCES

APPENDIX B

DOE CORRESPONDENCE

APPENDIX C

SEPTEMBER 30, 2004 LISTING OF HAZARDOUS WASTE SATELLITE ACCUMULATION AREAS AND 90-DAY STORAGE AREAS

TABLE 4-1
SSWMU #1
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #3 Lagoon 1	Groundwater	198	TCL VOC, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters	Analytes reported below TOGS 1.1.1 water quality standards or background levels. Radiological parameters identified above background levels in 6 locations.
	Lagoon Sediments	4	Radiological Parameters	Radiological parameters reported above background concentrations.
	Stream Sediments	3	TCL SVOCs, TAL Metals, and Expanded Radiological Parameters	Analytes reported below TAGM 4046 levels or three times background levels. Radiological parameters reported above background levels.
	Shallow Soil	8	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	Analytes reported below TAGM 4046 levels or three times background levels. Radioactivity slightly exceeds background at four locations.
	Deep Soil	12	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	VOCs reported below TAGM 4046 levels. Three SVOCs reported slightly above TAGM 4046 levels. Two metals slightly above background levels. Exceedance of radiological parameters above background levels attributed to Lagoon 1 and a wastewater transfer line leak.
SWMU #4 Lagoons 2, 3, 4, and 5	Groundwater	198	Same as SWMU #3.	Same as SWMU #3.
	Lagoon Sediments	37	TCL VOCs, SVOCs, Pesticides, Herbicides, and PCBs, TAL Metals, Radiological Parameters	VOCs were below TAGM 4046 levels. One SVOC exceeded TAGM 4046 levels in 1990. One metal was slightly above background. Radiological parameters identified above background levels.
	Stream Sediments	3	Same as SWMU #3.	Same as SWMU #3.
	Shallow Soil	10	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	Analytes reported below TAGM 4046 levels or three times background levels. Radioactivity slightly exceeds background at four locations.
	Deep Soil	12	Same as SWMU #3.	Same as SWMU #3.
SWMU #17 Low-Level Waste Treatment Facility	Groundwater	198	Same as SWMU #3.	Same as SWMU #3.
	Stream Sediments	3	Same as SWMU #3.	Same as SWMU #3.
	Shallow Soil	6	.Same as SWMU #3.	Same as SWMU #3.
	Deep Soil	12	Same as SWMU #3.	Same as SWMU #3.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-5
SSWMU #2
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU # 5 Demineralizer Sludge Ponds	Groundwater	64	TCL VOCs, SVOCs, Pesticides, and PCBs, and TAL Metals	All analytes reported below TOGS 1.1.1 water quality standards.
	Soil	2	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	All analytes reported below TAGM 4046 levels or three times background concentrations. Some radiological parameters were reported above screening levels.
	Sediment	9	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	All analytes, except for mercury from one sample reported below TAGM 4046 levels or three times background concentrations. Radiological parameters used to delineate sediment for removal and disposal.
SWMU # 6 Solvent Dike	Groundwater	64	Same as SWMU #5.	Same as SWMU #5.
	Soil	7	TCL VOCs and SVOCs, TBP, TAL Metals, and Radiological Parameters	All analytes reported below TAGM 4046 levels or three times background concentrations. Some radiological parameters were reported above screening levels.
	Sediment	2	TCL VOCs and SVOCs, and TAL Metals	All analytes reported below TAGM 4046 levels or three times background concentrations.
SWMU # 7 Effluent Mixing Basin	Groundwater	64	Same as SWMU #5.	Same as SWMU #5.
	Soil	1	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	All analytes reported below TAGM 4046 levels or three times background concentrations. Some radiological parameters were reported above screening levels.
	Sediment	2	TCL VOCs and SVOCs, and TAL Metals	All analytes reported below TAGM 4046 levels or three times background concentrations.
SWMU # 10 Paper Waste Incinerator	Groundwater	64	Same as SWMU #5.	Same as SWMU #5.
	Soil	3	TCL VOCs and SVOC's, TAL Metals, and Radiological Parameters	All analytes reported below TAGM 4046 levels or three times background levels. Some radiological parameters were reported above screening levels.
	Sediment	2	TCL VOCs and SVOCs, and TAL Metals	All analytes reported below TAGM 4046 levels or three times background level.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-6
SSWMU #3
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU # 18 Liquid Waste Treatment System and SWMU #22 Cement Solidification System	Groundwater	42	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Indicator Parameters	All analytes reported below TOGS 1.1.1 water quality standards. Radiological indicator parameters were reported above background levels. However, these monitoring wells are located in the Sr-90 plume.
	Shallow Soil	4	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Indicator Parameters	All organic analytes reported below TAGM 4046 levels. Metals concentrations reported below established TAGM 4046 levels or three times background concentrations. Some radiological indicator parameters reported above screening levels; however, these samples located within Sr-90 plume.
	Deep Soil	21	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Indicator Parameters	Same as for shallow soil.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-8
SSWMU #4
WVDP HIGH-LEVEL WASTE: HAZARDOUS WASTE CODES, HAZARDOUS WASTE CONSTITUENTS, AND UNDERLYING HAZARDOUS WASTE CONSTITUENTS

Hazardous Waste Characteristic		Constituent	6 NYCRR §376.4 Treatment Standards	
HW Code	Regulatory Limit		HLW	RCRA Metals
D002[1]	pH <2 / >12.5	—	HLVIT[2]	—
D005[1]	100 mg/L	Barium/Barium Compounds NOS	HLVIT[2]	21 mg/L TCLP
D005[1]	1.0 mg/L	Cadmium/Cadmium Compounds NOS	HLVIT[2]	0.11 mg/L TCLP
D007[1]	5.0 mg/L	Chromium/Chromium Compounds NOS	HLVIT[2]	0.60 mg/L TCLP
D009[1]	0.2 mg/L	Mercury/Mercury Compounds NOS	HLVIT[2]	0.025 mg/L TCLP
D010[1]	1.0 mg/L	Selenium/Selenium Compounds NOS	HLVIT[2]	5.7 mg/L TCLP
D011[1]	5.0 mg/L	Silver/Silver Compounds NOS	HLVIT[2]	0.14 mg/L TCLP
		40 CFR 261, Appendix VIII, Hazardous Constituents	Universal Treatment Standards for Underlying Hazardous Constituents	
			UHC[3]	UTS NWW Limit
		Antimony[4]/Antimony Compounds NOS	Antimony	1.15 mg/L TCLP
		Arsenic[4]/Arsenic Compounds NOS	Arsenic	5.0 mg/L TCLP
		Beryllium[5]/Beryllium Compounds NOS	Beryllium	1.22 mg/L TCLP
		Lead[4]/Lead Compounds NOS	Lead	0.75 mg/L TCLP
		Nickel[4]/Nickel Compounds NOS	Nickel	11.0 mg/L TCLP
		Thallium[4]/Thallium Compounds NOS	Thallium	0.20 mg/L TCLP
		Vanadium[3,5]	—	—
		—	Acetone[6]	160 mg/kg
		—	Methanol[6]	0.75 mg/L TCLP
		Methyl Ethyl Ketone[6]	MEK	36 mg/kg
		—	MIBK[6]	33 mg/kg
		—	Xylene[6]	30 mg/kg

1 Information from: Letter WR:95:0118, J.P. Jackson to S. Doleski, Replacement Page 6 of the WVDP RCRA Part A Permit Application, October 24, 1995.

2 HLVIT is the technology code for the vitrification of high-level mixed waste defined in 6 NYCRR 376.4 (a).

3 Zinc[4], Vanadium[5], and Fluoride[5] were identified as constituents in the waste. However, they are not underlying hazardous constituents in characteristic hazardous wastes (6 NYCRR 376.1[b] [2] [xii]).

4 Information from: Meeting with S. Barnes, J. Mahoney, J. Gerber, and B. Dubiel; Universal Treatment Standards Applicable to High-Level Waste, June 18, 1999.

5 Information from: Meeting with A. Arkali, B. Dubiel, and C. Biedermann; Appendix VIII and Underlying Hazardous Constituents in High-Level Waste at the WVDP; July 30, 1999. Beryllium is a suspected constituent from process cell windows. Vanadium is a suspected constituent from component and process equipment alloys. Fluoride is a known constituent from laboratory (digestion) wastes.

6 Information from: Letter WD:95:0010, J.P. Jackson to T. J. Rowland, "A&PC Laboratory Organic Waste Streams Dispositioned to Tank 8D-2," January 9, 1995. In this letter, Ethanol was identified as a constituent. However, Ethanol is not identified as a hazardous constituent in 6 NYCRR 371 Appendix 23, or as an underlying hazardous constituent in 6 NYCRR 376.4 (j).

Table 4-8 (*Concluded*)

Note 1 Other constituents (such as pesticides and PCBs, herbicides, phthalate esters, halogenated hydrocarbons, cyanides, and phenols) are occasionally detected in peripheral waste streams and samples at the WVDP, but were, at no time, disposed to the high-level tanks.

Note 2 Only hazardous constituents potentially present in Tank 8D-2 (i.e., at the point of generation) are included in this table. Byproducts generated by the process and glass formers added to the vitrification process are not included in the list of 40 CFR 261 Appendix VIII or 40 CFR 268.48 Universal Treatment Standards underlying hazardous constituent lists.

TABLE 4-9
SSWMU #4
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #13 HLW Tank Farm	Groundwater	40	TCL VOCs, SVOCs, Pesticides, and PCBs, and TAL Metals	Analytes reported below TOGS 1.1.1 water quality standards or within background levels.
	Stream Sediments	1	TCL SVOCs and TAL Metals	Three PAHs reported at estimated concentrations above TAGM 4046 levels. However, the sampling location was adjacent to an asphalt roadway. Metals reported below regulatory levels or three times background levels.
	Surface Soil	2	TCL VOCs and Radiological Parameters	Analytes reported below TAGM 4046 levels or three times background levels. Radioactivity slightly exceeds background at four locations.
	Deep Soil	4	TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	VOCs and SVOCs reported below TAGM 4046 levels. Three SVOCs reported slightly above TAGM 4046 levels. No metals reported above three times background levels. Radiological parameters within the range of established screening levels.
SWMU #19 Supernatant Treatment System	Groundwater	40	Same as SWMU #13.	Same as SWMU #13.
	Stream Sediments	1	Same as SWMU #13.	Same as SWMU #13.
	Deep Soil	4	Same as SWMU #13.	Same as SWMU #13.
SWMU #20 Vitrification Facility	Groundwater	40	Same as SWMU #13.	Same as SWMU #13.
	Stream Sediments	1	Same as SWMU #13.	Same as SWMU #13.
	Deep Soil	4	Same as SWMU #13.	Same as SWMU #13.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-11
SSWMU #5
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #8 Maintenance Shop Leach Field	Groundwater	42	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters	VOCs, SVOCs, Pesticides, and PCBs reported below TOGS 1.1.1 water quality standards. Metals concentrations are within background levels established for the sand and gravel unit. Elevated radiological parameter levels are attributed to North Plateau Sr-90 plume.
	Surface Soil	2	TOC, TOX, TKN, phenols, and TCL VOCs	All results were below regulatory levels
	Shallow Soil	5	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters	VOCs, SVOCs, Pesticides, and PCBs reported below TAGM 4046 levels. Arsenic and beryllium slightly exceeded WVDP background levels, but well below 3 times soil background. Slightly elevated radiological parameter levels attributed to North Plateau Sr-90 plume.
	Deep Soil	11	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters	

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-13
SSWMU #6
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #9/9A Old and New Hardstands	Groundwater	30	TCL VOCs and SVOCs, Pesticides, PCBs, and TAL Metals	Analytes reported below TOGS 1.1.1 water quality standards or within site background levels.
	Stream Sediments	2	TCL VOCs and SVOCs, and TAL Metals	Three PAHs reported at estimated concentrations above TAGM 4046 levels. However, the sampling location was adjacent to an asphalt roadway. Metals reported below regulatory or three times background levels.
	Surface Soil	2	TCL VOCs and SVOCs, and TAL Metals	Analytes reported below TAGM 4046 levels or three times background levels.
	Deep Soil	4	TCL VOCs and SVOCs, and TAL Metals	VOCs and SVOCs reported below TAGM 4046 levels. No metals reported above three times background levels.
SWMU #15 LAG Storage Building	Groundwater	30	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Stream Sediments	2	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Surface Soil	2	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Deep Soil	4	Same as SWMU #9/9A.	Same as SWMU #9/9A.
SWMU #16/16A LSAs #1, 2 Hardstand, 3, and 4	Groundwater	30	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Stream Sediments	2	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Shallow Soil	3	Same as SWMU #9/9A.	Same as SWMU #9/9A.
	Deep Soil	4	Same as SWMU #9/9A.	Same as SWMU #9/9A.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-14
SSWMU #7
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #14 Chemical Process Cell – Waste Storage Area	Groundwater	42	TCL VOCs and SVOCs, Pesticides, PCBs, TAL Metals, and Radiological Indicator Parameters	Analytes reported below TOGS 1.1.1 water quality standards or within site background levels. Gross beta levels exceed background well 0704.
	Stream Sediments	2	TCL VOCs and TAL Metals	Analytes reported below TAGM 4046 levels or site three times background levels.
	Surface Soil	1	TCL SVOCs and TAL Metals	Analytes reported below TAGM 4046 levels or three times site background levels.
	Deep Soil	1	TCL VOCs and TAL Metals	Analytes reported below TAGM 4046 levels or three times site background levels.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-15
SSWMU #8
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #1 Construction and Demolition Debris Landfill	1985 Leachate Water 1985 Leachate Soil	2 1	EP Toxicity Metals and Total Halogenated Organics	Analytes reported below regulatory levels.
	1990 Leachate Water	1	VOCs, Total Halogenated Organics, phenols, Metals, and Cyanide	Organic analytes reported below TOGS 1.1.1 water quality standards. Metals and cyanide reported below TOGS water quality standards or within site historical results.
	Surface Water	18 2	VOCs, SVOCs, Pesticides, PCBs, and Total Metals TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals	Analytes reported below TOGS water quality standards or within site background levels for metals. Analytes reported below TOGS water quality standards or within site background levels.
	Groundwater	120	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Indicator Parameters	Dichlorodifluoromethane and 1,1-dichloroethane reported above TOGS 1.1.1 water quality standards. Remaining analytes reported below TOGS water quality standards or within site background levels. Elevated levels of gross beta and tritium detected in both upgradient and downgradient monitoring wells and above background levels. However, these elevated levels are believed to be associated with the Sr-90 plume in the North Plateau.
	Stream Sediments	3	TCL VOCs, TAL Metals, and Radiological Indicator Parameters	Analytes reported below TAGM 4046 levels. Several metals reported above three times background levels, including copper, lead, and selenium. Radiological indicator parameters reported above background screening levels; however, they have been attributed to the Sr-90 plume in the North Plateau.
	Surface Soil Surface Soil (from landfill cap) Deep Soil	4 2 7	TAL Metals TCL VOCs, SVOCs, Pesticides and PCBs TCL VOCs and SVOCs, TAL Metals, and Radiological Indicator Parameters	Analytes reported below TAGM 4046 or three times site background levels. Analytes reported below TAGM 4046 with the exception of benzo(a)pyrene. Analytes reported below TAGM 4046 or three times site background levels. Radiological indicator parameters reported above background screening levels; however, they have been attributed to the Sr-90 plume in the North Plateau.

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998).

TABLE 4-17
SSWMU #9
SUMMARY OF PRE- AND RFI ANALYTICAL DATA

Unit	Environmental Media	Number of Samples	Analytes	Comments
SWMU #2 NRC-Licensed Disposal Area	Groundwater	113	TCL VOCs, SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters	All of the analytes detected were below TOGS water quality standards or background levels. Radiological parameters identified above background levels at two locations.
	Stream Sediments	3	TCL SVOCs, TAL Metals, and Expanded Radiological Parameters	Analytes detected were below TAGM 4046 or 3 times site background levels. Radiological parameters reported above background levels.
	Shallow Soil Deep Soil	7 7	TCL VOCs and SVOCs, Pesticides, and PCBs, TAL Metals, and Radiological Parameters (4) TAL Metals (3) TCL VOCs and SVOCs, TAL Metals, and Radiological Parameters	Analytes detected were below TAGM 4046 or 3 times site background levels. Radioactivity slightly exceeds background at four locations. VOCs and SVOCs detected were below TAGM 4046 levels. Metals detected below 3 times site background levels. Radiological parameters exceeded background levels at both sampling locations.
SWMU #11/11a The Kerosene Tanks and the IWSF	Groundwater	113	Same as SWMU #2.	Same as SWMU #2.
	Stream Sediments	3	Same as SWMU #2.	Same as SWMU #2.
	Shallow Soil Deep Soil	7 7	Same as SWMU #2 Same as SWMU #2	Same as SWMU #2. Same as SWMU #2.
SWMU #23 The Trench Interceptor Project	Groundwater	113	Same as SWMU #2	Same as SWMU #2.
	Shallow Soil Deep Soil	7 7	Same as SWMU #2 Same as SWMU #2	Same as SWMU #2. Same as SWMU #2.
	Stream Sediment	3	Same as SWMU #2	Same as SWMU #2

Notes:
Groundwater metals results for chromium and nickel have been evaluated against levels of these analytes presented in *Final Report: Evaluation of Pilot Program to investigate Chromium and Nickel Concentrations in Groundwater in the Sand and Gravel Unit* (Dames & Moore, June 1998)

TABLE 4-20
SEALED ROOMS DESCRIPTION AND OPERATIONAL HISTORY SUMMARY

SEALED ROOM	DESCRIPTION	HISTORICAL OPERATIONS	IDENTIFIED ACTIONS AND DOE ACTIONS
Mechanical Process Cell (i.e., Process Mechanical Cell)	12 ft (3.7 m) by 52 ft (15.9 m) by 25 ft (7.6 m) high; reinforced concrete; stainless-steel-lined floor and walls to 20.7 ft (6.3 m).	Only mechanical processing activities performed (i.e., cutting, shearing, sawing). Generated wastes packaged and transferred for disposal.	Lead debris identified in cell. DOE performed cell upgrade and cleanup to remove identified waste. NYSDEC notified in RCRA §3008(h) Quarterly Reports.
Ram Equipment Room	27.9 ft (8.5 m) by 11.8 ft (3.6 m) by 13.5 ft (4.1 m) high; reinforced concrete; carboline-coated walls, floor, and ceiling.	Only mechanical processing activities performed (i.e., sawing). Drummed wastes managed in room awaiting disposal.	Room previously used for the storage of 36 drums containing radiological waste and removed the "pushout rams" in the early 1980's. Currently XC-2 rails located in the entry to this room.
General Process Cell	45.6 ft (13.9 m) by 10.4 ft (3.2 m) by 75 ft (22.9 m) high; reinforced concrete; stainless-steel-lined floor and walls to 16 ft (4.8 m).	Equipped to transfer sheared fuel from the PMC to the CPC and scrap from the PMC and leached cladding from the CPC to the Scrap Removal Room.	Lead debris identified in cell. DOE performed cell upgrade and cleanup to remove identified waste. NYSDEC notified in RCRA §3008(h) Quarterly Reports.
Miniature Cell	11 ft (3.4 m) by 13.5 ft (4.1 m) by 18 ft (5.5 m) high; reinforced concrete; stainless-steel-lined floor and sump.	This cell was not used for fuel reprocessing activities, as it was built for possible use as an experimental, research, or special project area.	No RCRA hazardous constituents identified in cell debris; DOE removed miscellaneous debris from cell.
Extraction Cell #1 (XC-1)	16 ft (4.9 m) by 16.5 ft (5 m) by 55 ft (16.8 m) high; reinforced concrete; stainless-steel-lined floor, sump, and walls to 18 inches (46 cm). Remaining wall areas are coated with carboline.	Uranium and plutonium in the dissolved nuclear fuel was separated from the fission products using a solvent extraction process. A second solvent extraction process separated the uranium from the plutonium.	DOE has performed radiological characterization in XC-1. No waste removal has been performed to date.
Extraction Cell #2 (XC-2)	20.8 ft (6.3 m) by 21 ft (6.4 m) by 57 ft (17.4 m) high; reinforced concrete; stainless-steel-lined floor, sump, and walls to 18 inches (46 cm).	Contained the solvent extraction columns and feed tanks for the last stage of the partition cycle, the first uranium and plutonium cycles.	Acidic/corrosive waste liquids, equipment, and debris removed from XC-2. NYSDEC notified of corrosive waste generation in RCRA §3008(h) Quarterly Report.
Upper Warm Aisle Pump Niches (UWA)/Solvent Storage Terrace (SST)	16 ft (4.9 m) by 90 ft (27.4 m) by 18.5 ft (5.6 m) high; reinforced concrete; stainless-steel-lined floor and walls of niches. The SST was located on the south side of the Process Building on the roof of the UWA at a plant elevation of 131 ft (39.9 m).	The UWA contains 6 shielded concrete niches that housed pumps and valves associated with reprocessing operations in the XCs. Two pump niches contain pumps and valves supporting LWTS operations. Storage tanks (4) in the SST were used during fuel reprocessing activities. One 5,000-gal (18,925-L) tank collected recovered nitric acid and three 3,000-gal (13,250-L) tanks collected TBP and n-dodecane. The tanks within the SST have been removed from service.	SST utilized for portable ventilation units operations for XC-2 and PPC work

TABLE 4-20 (*Continued*)
SEALED ROOMS DESCRIPTION AND OPERATIONAL HISTORY SUMMARY

SEALED ROOM	DESCRIPTION	HISTORICAL OPERATIONS	IDENTIFIED ACTIONS AND DOE ACTIONS
Liquid Waste Cell	North-south leg at 46.2 ft (14.1 m) by 17 ft (5.2 m) and east-west leg at 19 ft (5.8 m) by 15.8 ft (4.8 m) by 19.5 ft (5.9 m) high; reinforced concrete; stainless-steel-lined floor, sump, and walls to 18 inches (46 cm). Remaining wall areas are coated with carboline.	Nine waste collection tanks were used to receive radioactive solutions from the XCs, the CPC, and the A&PC Hot Cells. Five of the tanks (7D-2, 3D-2, 7D-14, 4D-10, and 13D-8) are currently utilized as part of the LWTS.	Further waste characterization will be performed during D&D activities for this cell.
Acid Recovery Cell (ARC)	28.8 ft (8.8 m) by 30.5 ft (9.3 m) by 26.5 ft (8.1 m) high; concrete and/or concrete-filled block; 1-ft-daimeter (0.3-m) sump on east side of cell.	This cell was part of the acid recovery system that recovered nitric acid used to dissolve spent nuclear fuel. The acid was principally recovered by evaporation and fractionation of the aqueous waste streams generated in the solvent extraction process.	DOE has not used this cell for project purposes. DOE has performed a radiological characterization of this cell and further waste characterization will be performed during D&D activities for this cell.
Acid Recovery Pump Room (ARPR)	16 ft (4.9 m) by 22.8 ft (7 m) by 10 ft (3.1 m) high; reinforced concrete; carboline-coated floor, floor drain, walls, and ceiling.	This room contained a weak acid tank and pumps to transfer decontaminated high-activity nitric acid streams from the (ARC) to various storage vessels within the Process Building. The ARPR is no longer used operationally and decontamination and cleanup of this room was completed in 2001.	ARPR D&D activities identified corrosive liquid wastes, as well as RCRA metals in vacuumed floor debris (based on totals analysis). DOE performed D&D of the ARPR in 2001. Information provided via telecon to NYSDEC and in RCRA §3008(h) Quarterly Reports.
Hot Acid Cell	17.3 ft (5.3 m) by 20.5 ft (6.3 m) by 15 ft (4.6 m) high; reinforced concrete; corrugated steel roof.	This cell contains 2 tanks that were used to store radioactive nitric acid produced in the acid recovery cells, and then used to dissolve nuclear fuel in the CPC.	DOE has not used this cell for project purposes. DOE has performed a radiological characterization of this cell.
Off-Gas Cell	12 ft (3.7 m) by 30.5 ft (9.3 m) by 29 ft (8.8 m) high; reinforced concrete; carboline-coated floor, walls, and ceiling; two floor sumps equipped with level indicators and high-level alarms.	This cell housed the equipment for the dissolver and vessel off-gas (VOG) systems. The dissolver off-gas (DOG) system has been inoperative since November 1975. The vessel off-gas system is still active. Condensate collects in tank 6D-3 with air continuing through the off-gas scrubber (6C-3). The air then passes through HEPA filters before being discharged through the main stack.	The VOG System is utilized by DOE to ventilate gasses from vessels and tanks in the Process Building. The DOG Scrubber could contain 234 gal (884 L) of uncharacterized liquids. Further characterization will be performed during D&D activities for this cell.
Off-Gas Blower Room	11.8 ft (3.6 m) by 32.5 ft (9.9 m) by 9.5 ft (2.9 m) high; reinforced concrete; carboline-coated floor, walls, and ceiling.	This room contained blowers, filters, and scrubber recirculation pumps for the Process Building dissolver and vessel off-gas systems. Equipment has been decontaminated and replaced, as necessary, for continued use.	The VOG treatment train utilizes filters located in this room, which is being utilized by DOE.

TABLE 4-20 (*Concluded*)
SEALED ROOMS DESCRIPTION AND OPERATIONAL HISTORY SUMMARY

SEALED ROOM	DESCRIPTION	HISTORICAL OPERATIONS	IDENTIFIED ACTIONS AND DOE ACTIONS
Ventilation Wash Room (VWR)	20 ft (6.1 m) by 25 ft (7.6 m) by 15.5 ft (4.7 m) high; reinforced concrete floor, walls, and ceiling.	This room was designated to scrub particulates from cell exhausts before the air entered the main ventilation exhaust plenum (inc. laboratory hood exhausts). The air was scrubbed in 2 or 3 stages using recirculated water. This area is not currently used in daily WVDP operations.	The proposed Decontamination Plan for the VRW identified sampling results that indicated the presence of barium, chromium, and mercury. This information was provided to NYSDEC in a RCRA §3008(h) Quarterly Report. Although the washer is not being used, currently, air flows from the VWR supply plenum to the main ventilation exhaust system plenum. Therefore, DOE is passively utilizing the WVR for contaminated air management purposes.
Scrap Removal Room (SRR)	12 ft (3.7 m) by 40.3 ft (12.3 m) by 13.5 ft (4.1 m) high; concrete floors, walls, and ceiling; two 4-ft (1.2-m) by 30-ft (9.1-m) stainless-steel floor strips; carboline coating on remaining floors and walls; two floor drains.	30-gal drums containing wastes, such as leached fuel hulls, were placed into shielded casks for transport to the NDA for burial. The cask, cell, and truck trailer were decontaminated before the trailer left the SRR. The SRR was also used to store a 750-gal (2,840-L) tank that contained material removed from tank 7D-13.	SRR Tank was characterized as non-RCRA and results provided to NYSDEC. Additionally, the SRR has been utilized as a SAA for removal of Process Mechanical Cell and General Purpose Cell RCRA wastes. Equipment from the SRR was removed by DOE. Currently the SRR is being used as a staging area for waste container removal from the Head End Cell projects.
Master Slave Manipulator (MSM)	37 ft (11.3 m) by 42 ft (12.8 m) by 15 ft (4.6 m) high; concrete floors and walls; former floor drain and associated catch tank (15D-6); stainless-steel lined floor and walls to 18 inches (46 cm); epoxy-coated walls and ceiling; concrete floor removed, disposed, and replaced	See Section 5.13 for operational history summary.	The MSM Shop is currently being utilized as a repair shop for contaminated manipulators. The southwest end of the MSM Shop was converted into the CSRF, which is a RCRA Interim Status unit identified in the RCRA Part A application.